

Railway Age

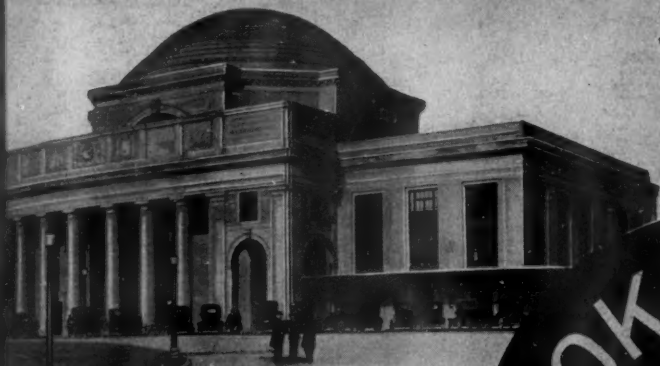
DAILY EDITION

FIRST HALF OF 1920—No. 11a

CHICAGO—TUESDAY, MARCH 16, 1920—NEW YORK

SIXTY-FIFTH YEAR

CHICAGO AND NORTH-
WESTERN TERMINAL



RICHMOND, (VA.) TERMINAL
R.F. & P.— A.C. L.



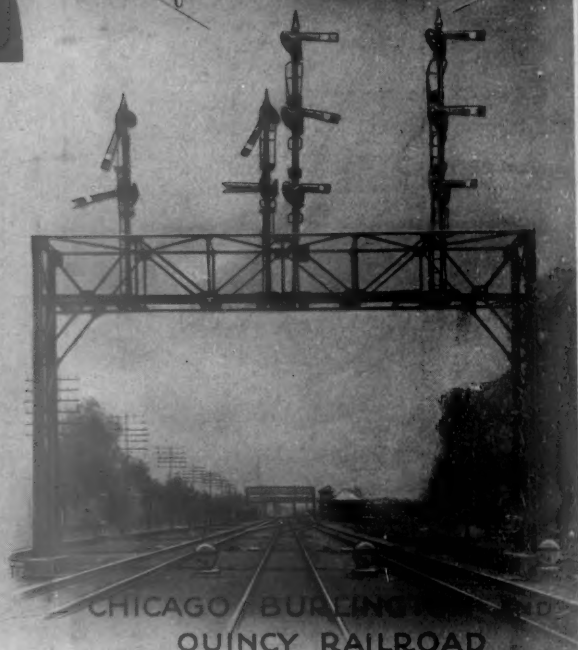
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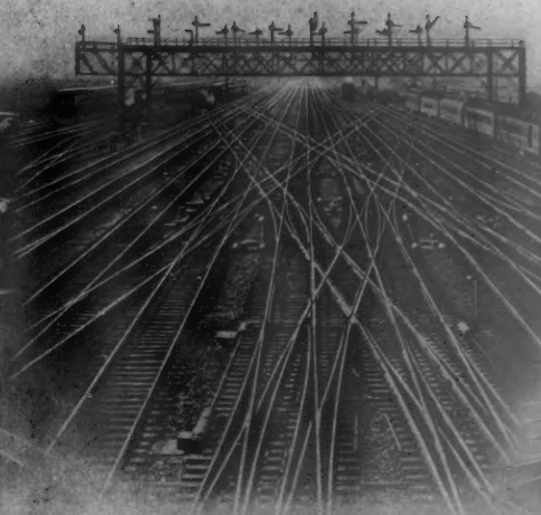
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EDITORIAL

Railway Age

DAILY EDITION

The attendance at the fifth meeting of the Signal division surpassed the expectations of those in charge. That such

The Signal Division Attendance

a large number were in attendance may have been due to a desire on the part of the members to learn first hand what action was to be taken concerning the status of the division

since the termination of federal control and the natural desire of the members to exchange views on the subject. Whatever the cause, the fact remains that signal men of all classes are taking a very active interest in the work being done by the division. Definitely the registration yesterday showed a total of 248 railroad men and 98 supply men, or a total of 346 present as compared with a total of 319 members of all classes present last year.

Many members of the Signal division were opposed to the amalgamation of the Railway Signal Association with the American Railroad Association.

Remove the Cause for Dissatisfaction

The dissatisfaction which now exists is apparently caused by the fact that it is necessary to submit all specifications and recommended practices, after

their adoption, to a general committee on which a large majority of the members are only in part a part of the American Railroad Association. The feeling exists that the division has lost control over its own functions, as such recommended practices may lay dormant until the general committee may see fit to act. After this committee acts, the practices passed by it are referred to a sub-committee on standards of the American Railroad Association, which may not act on them for some time. Consequently, recommendations made by the Signal division may not be approved until a year, or perhaps longer, after their adoption. This delays their publication in the Manual. A large part of the criticism directed towards the amalgamation in the past may be removed if proper consideration is given to remedying these conditions by the Association of Railway Executives in connection with the reorganization of the A. R. A.

The American people generally are awakening to the relationship between production and the cost of living. The

Education for Increased Production

railroads, even though they may be considered only a single tooth in the cog that aids in grinding out the finished products, are important enough to offer a tremendous hindrance if

they do not function properly. Indeed, because of inadequate facilities they are today the limiting factor in the production of many things. The signal department, because of its relationship to the safety and despatch of trains, must bear a distinct share of the responsibility of the railroads for their part in increasing production. Improved apparatus is important, but for immediate results it will be necessary in most cases to increase the efficiency of the present equipment. How can the Signal division best help in this emergency? Does it not offer

a special opportunity for the Sectional committees? These committees command the attention of the entire rank and file of those engaged in railway signaling and if the matter of increased production through efficiency and better maintenance is presented properly before their meetings, the results will undoubtedly prove productive.

Solve Your Problems at the Exhibit

A vital need of the railroads today is the installation of labor-saving and other devices that will increase efficiency, improve transportation and solve some of the operating problems with which the roads are confronted. Railroad officers in attendance at the

convention have an excellent opportunity to discuss and inspect carefully the improved and new equipment and devices on exhibit at the Coliseum. The supply companies spend liberally of money and time to present their products in an interesting and instructive manner. Their representatives are on hand to explain in detail the good features of the equipment. It is logical to assume that if those who inspect the exhibits are prepared to study them with the view of determining whether the particular devices will solve their problems in a more economical and less expensive way, then they will gain much by such an inspection. Most roads are preparing or have prepared programs for new work to be carried out during the next year. The signal men who are directly responsible for carrying out such programs should examine the signal exhibit carefully and should be prepared to ask all the questions that will enable them to determine how the various signal devices, particularly the new ones, will fit into the proposed new work, keeping in mind the factors that involve first cost, cost of maintenance and operation, efficiency and service.

Twenty-five years ago, on the eleventh of March, the Railway Signaling Club was organized, and 17 years ago

The Signal Division and Its Future

its name was changed to the Railway Signal Association, which name it retained for 16 years. During the first 24 years it grew in strength and influence, until a year ago it became

the Signal division, Engineering Section, American Railroad Association. Because of its sturdy nature it was able to carry the weight of so long a name with dignity and with honor to itself and to the association of which it is now a part. Its friends—and there are many—familiarily nicknamed it the Signal division. As such it is now celebrating its first birthday as a part of the parent organization, and during the past year it has run true to form in accomplishing much good work. At the time of its amalgamation some members were bitterly opposed to its change in status, others were neutral in feeling, and still others were favorably disposed to the change. Good arguments were advanced by those both for or against the change as to why its status should remain the same or why the amalgamation would be of benefit. A marked difference of opinion still exists. The fact remains that

much good work has been accomplished in the past and that regardless of its name or affiliation much more good work will be accomplished in the future. There is an old Chinese proverb saying that "there is a time to fish and a time to dry nets." "The time to fish" has passed, while "the time to dry nets" is here. Consequently, irrespective of what the future may hold, it should be the aim of all to co-operate in anything that is best for the common good of the organization so that it may continue to increase in prestige and be a power in increasing efficiency in signal work.

State Road Building and the Railroads

THE ROAD BUILDING PROGRAMS planned by various states throughout the country in 1919 for completion during this year were extremely ambitious and called for a surprisingly large total mileage. These plans are now being curtailed for several very good reasons. The lack of means of transportation of materials, an insufficient number of responsible contractors to undertake the work, the high cost of and the difficulties encountered in securing both labor and materials in adequate amounts are some of the factors that have led to the conclusion that the programs, as originally contemplated, must be modified.

The first of these, the lack of transportation facilities, is particularly significant. The railways are now emerging from an extended period marked by restricted construction activities. As a result they truthfully may be said to have reached or passed the point of saturation in so far as their capacity for handling business is concerned. This is a condition which is hampering not only the carrying out of road building programs, but is, as well, acting as a deterrent to the industrial expansion of the country as a whole. It seems, therefore, that the restoring of the railroads to a position where they will welcome and be able to take good care of additional business is a prime necessity.

To do this will tax all our resources. The rehabilitation of the railways is largely a question of man-power. To go ahead with the construction of highways in the ambitious way originally planned will also require the employment of unskilled labor in large quantities. If these projects are carried out simultaneously the result will be disastrous competition for man-power between state authorities and the railroads, a situation which will be unfortunate for both parties. The states will find themselves possessed of highways constructed at extremely high costs and burdened with needless debts and the time when the railways will be able to perform their functions properly will be uselessly deferred. In the light of these facts the decision of Illinois and some other states to defer highway work for this year seems to be the part of wisdom and it is to be expected and hoped that other states will adopt like policies.

Oil for Signal Mechanisms

THE VALUE OF OIL as a lubricating medium is based on its adhesive and cohesive qualities. By adhesive quality is meant its ability to adhere to the parts to be lubricated, while the cohesive quality enables it to maintain a film of lubricant on the surfaces that require lubrication. Under these conditions the moving apparatus floats without touching the stationary parts, which results in a film of lubricant being divided into two layers, the one movable; the other stationary. As the internal fluid frictional resistance of the lubricating oil is small, the resistance of the bearing parts is reduced.

The moving and adjacent parts of signal mechanisms

necessarily must be free-running and subjected to as little frictional resistance as possible. Any tendency on the part of the oil which is used for lubricating such apparatus to gum, freeze or evaporate may be the cause of signal failures. It is not uncommon for the temperature to fall to 40 or 50 deg. below zero in some sections of the country. This is particularly true in the regions traversed by some of the northern roads, and unless a satisfactory oil is used for lubricating the signal mechanisms on certain sections of these roads trouble is liable to develop. The most serious failure which can develop is, of course, a false clear signal indication. A few cases of this nature have been known to occur because the lubricating oil did not flow satisfactorily at low temperatures. On the other hand, there are roads in other parts of the country where the other extreme of temperature prevails, and this brings about a condition wherein the oil may be subject to evaporation because of the extreme heat. This condition has also been known to have caused signals to operate improperly. It is evident, therefore, that the proper lubrication of signal mechanisms is a complicated and difficult problem. This is indicated by the fact that the Signal division Committee on Oils submitted two specifications on lubricating oil for signal mechanisms which appear elsewhere in this issue. One specification is for zero deg. F. and the other for 45 deg. below zero F.

As a matter of fact, the source of supply of lubricating oil for signal mechanisms that will satisfy a single specification designed to meet the requirements in both warm and cold climates is limited to a few oil fields. On the other hand, a large number of fields can supply oil that will work satisfactorily for lubricating purposes where the climatic conditions are such that the various factors involved, such as evaporation, viscosity, cold, etc., are workable within the range of temperature changes which prevail in certain sections of the country throughout the year. As such oils will not work satisfactorily in all sections of the country it would appear advisable in order to provide a broader field of supply to have the specifications drawn up in such a manner as to permit the roads to base their requirements on the exact conditions which have to be met, even though it may be necessary for some roads to use two grades of oil, one for warm and the other for cold weather.

Valuation and Depreciation

GREATER IMPORTANCE will be attached to valuation now and in the future than in the past. This is because of the provisions contained in the new transportation law. A part of the law bearing on the regulation of rates with reference to valuation says "whenever pursuant to section 19a (pertaining to valuation) of this Act the value of the railway property of any carrier held for and used in the service of transportation has been finally ascertained, the value so ascertained shall be deemed by the Commission to be the value thereof for the purpose of determining such aggregate value" (for rate making purposes).

While signal valuation is but a small part of the total railroad valuation, still it is an important part. Consequently the Committee on Valuation appointed by the Signal division should become one of the most important committees of the association. The work undertaken by this committee cannot be accomplished in a day or in a year, and to function properly it will be necessary to have the co-operation of all railway signal departments.

In attempting to tabulate information pertaining to the average service life in years of the important units of the different types of signal installations the commit-

tee stated that it had sent out a list of approximately 100 major units to 152 railroads for opinions of the maximum life of these units, separating the physical from functional depreciation. The committee proceeds to say that "up to January 10, 33 replies had been received representing approximately 61 railroads, 7 of which gave no information, and a large percentage of the balance gave only opinions which differed widely." That such a condition exists is because few, if any, signal department organizations have attempted to determine in the past the average length of life of the various classes of signal material.

It is important and essential that some definite method be employed in the future to determine the average service life of materials, and the committee could do no better work at the present time than to suggest a method or scheme which may be employed by the various signal departments for keeping a record of the various major units from the time of their installation to their retirement. It is recognized that with certain materials having a relatively long life, the average length of life for the present will have to be based on past performance, but this should not prevent the establishment of a scheme of uniform records for this purpose. Authoritative information upon the actual physical depreciation of materials can only be obtained in such a manner.

With reference to depreciation an interesting question is raised by the passage of the new railroad legislation in that the law instructs the commission to prescribe for the carriers subject to the Act, the classes of property on which depreciation charges may be made. Under the Valuation Act the carriers felt it to be to their advantage to claim a very low rate of depreciation in order to obtain a higher valuation on their properties, some carriers contending that no depreciation existed. Now under the provision of the new law it will be to the advantage of the carriers to charge off under operating expenses as heavy a depreciation percentage as possible. It would appear that some carriers are placed in a position where they cannot consistently advocate to the Commission that a higher percentage should be allowed on various classes of property than the Commission may see fit to allow. It will be interesting to see what stand the Commission will take in this matter.

Today's Program of the Signal Division

The following reports are scheduled for presentation before the meeting in the Gold room today:

- Committee XI—Batteries.
- Committee VIII—Alternating Current Automatic Block Signaling.
- Committee XII—Contracts.
- Committee V—Maintenance Rules and Instructions.
- Committee IV—Direct Current Automatic Block Signaling.

In addition to the above, the following reports that were scheduled for yesterday were carried over for consideration at today's meeting:

- Committee VII—Direct Current Relays.
- Committee IX—Wires and Cables.
- Committee XIII—Electrical Testing.
- Committee III—Power Interlocking.

A. R. E. A. Joins Engineering Council

At a meeting of the Board of Direction of the American Railway Engineering Association yesterday, it was decided to affiliate with Engineering Council.

American Railway Engineering

Association Convention Program

The following is the program for the American Railway Engineering convention opening this morning. Morning sessions will extend from 9:30 to 12:30 and afternoon sessions from 2 to 5.

Tuesday, March 16

President's Address.

Reports of Secretary and Treasurer.

Reports of Standing and Special Committees.

Water Service.....	Bulletin 220
Masonry	Bulletin 220
Buildings	Bulletin 220
Uniform General Contract Forms.....	Bulletin 220
Track	Bulletin 221
Electricity	Bulletin 221
Conservation of Natural Resources.....	Bulletin 221
Economics of Railway Location.....	Bulletin 221

Wednesday, March 17

Wood Preservation.....	Bulletin 222
Ballast	Bulletin 222
Iron and Steel Structures.....	Bulletin 223
Special Stresses in Railroad Track.....	Bulletin 224
Ties	Bulletin 223
Roadway	Bulletin 224
Rules and Organization.....	Bulletin 222
Economics of Railway Labor.....	Bulletin 223

Annual Dinner at 6:30 p. m.

Thursday, March 18

Signals and Interlocking.....	Bulletin 224
Yards and Terminals.....	Bulletin 225
Rail	Bulletin 225
Records and Accounts.....	Bulletin 222
Signs, Fences and Crossings.....	Bulletin 223
Wooden Bridges and Trestles.....	Bulletin 225
Economics of Railway Operation.....	Bulletin 225
Special Standardization.....	Bulletin 223

New Business.

Election and Installation of Officers.

Adjournment.

Who Are Subordinate Officials?

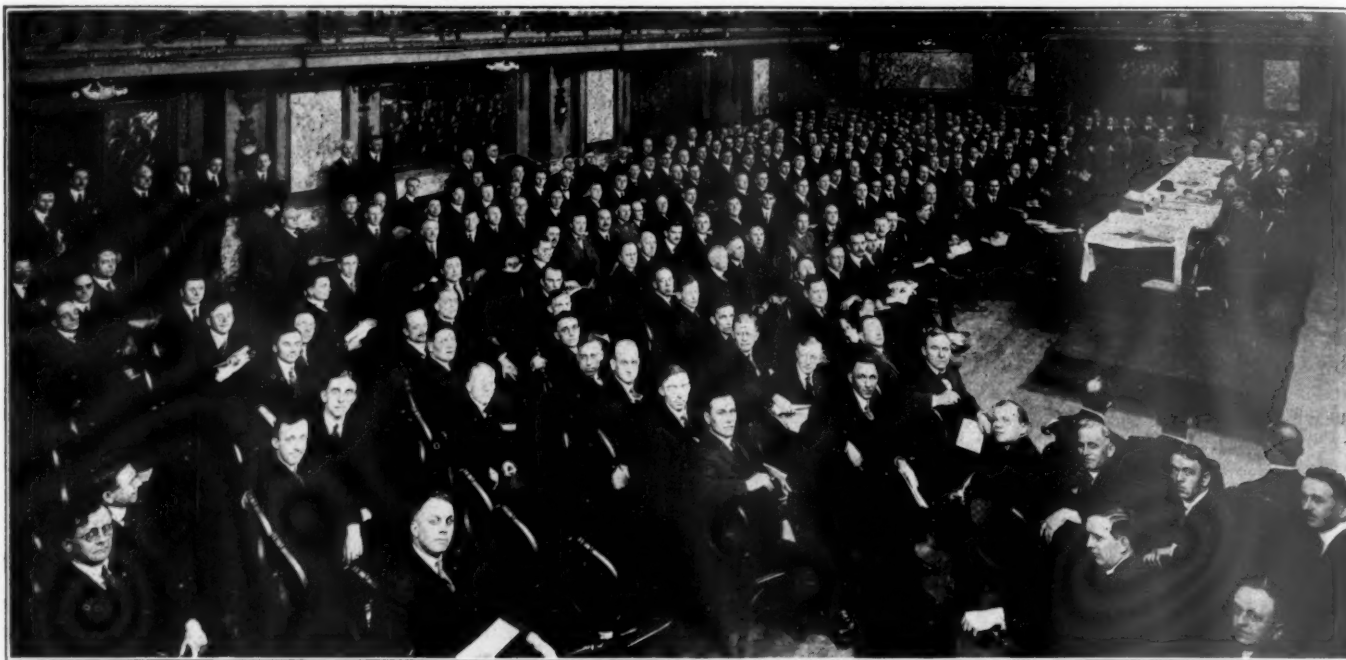
WASHINGTON, D. C., March 15, 1920.

The Interstate Commerce Commission held a meeting at Washington on Monday for the purpose of determining what classes of railway officers should be included within the term subordinate official as used in the Transportation Act and also to ascertain whether its regulations regarding the making of nominations for appointments as members of the Railroad Labor Board should be modified. L. K. Sherman appeared in behalf of the American Association of Engineers to ask that all engineers below the rank of chief engineer, engineer maintenance of way and division engineer be classified as subordinate officials. The hearing developed into a spirited jurisdictional controversy; several of those present representing minor officials demanded recognition as subordinate officers; representatives of the labor unions demanded the right of their organizations to represent many of these junior officers, while the railway executives asked that those having confidential relations with the managements, or dealing with employment, discipline or wages be classified as officials.

Roads Accepting Guarantee

WASHINGTON, D. C., March 15, 1920.

The Interstate Commerce Commission kept its offices open until midnight Monday for the purpose of receiving acceptances from railroad companies of the six months' guarantee provided in the new Transportation Act. Many of the companies have accepted this guarantee and agreed to turn over to the government any excess earned over the guarantee. The Pere Marquette has decided not to accept the guarantee.



Signal Division in Session

The Signal Division Holds Its Fifth Meeting

Membership at Opening Session Votes to Return to Former Status, But This Action Is Withdrawn in Afternoon

ACTION OF VITAL IMPORTANCE to the Signal division was taken at the morning session yesterday when its return to the former status of the Railway Signal Association came up for consideration. Immediately after the morning session was called to order by Chairman C. J. Kelloway, superintendent of signals, Atlantic Coast Line, at 10 a. m., he outlined the action taken by the Committee of Direction at its meeting on Sunday, March 14. A very spirited discussion arose over the action taken by the Committee of Direction and a resolution offered by W. J. Eck, signal and electrical superintendent, Southern, some members feeling that the Signal division should remain as part of the A. R. A., while others thought that it should return to its former status. Still other members present felt that no action was necessary, and that the Signal division had returned automatically to its former status as the R. S. A. at the time federal control ceased to exist. When Mr. Eck's resolution, indorsing the action of the Committee of Direction, was put to a vote, it was carried by a large majority, 201 voting for the adoption.

Abstract of Chairman Kelloway's Statement

Effective midnight, February 28, 1919, the activities of the Railway Signal Association were transferred to the American Railroad Association. Order No. 70, issued by the director general of railroads on January 10, 1919, having been complied with by this association, and as this order was only effective during the period of federal control, the action of the board in arranging for the amalgamation was an emergency measure similar to that taken by many associations, not only those of railroad men but by many other organizations, during the war period, suspending constitutions, ignoring by-laws, etc. In fact, it was very much in line with the action taken in regard to the railroads themselves, where the corporate officers ceased to function as operatives of their property, the government assuming control, rearranging the roads

and consolidating them into regions, and for the emergency of the war and until March 1, 1920, took control of the properties.

Therefore, as the Board of Direction of the Railway Signal Association suspended the constitution of the Railway Signal Association as an emergency measure, which suspension was endorsed by the membership at a states meeting held in Chicago, Ill., on March 17, 1919, the Committee of Direction of the Signal Division, Section II—Engineering, American Railroad Association, has voted that, as the railroads have returned to corporate control and as the office of the director general of railroads has been abolished and his instructions have lapsed with the expiration of his office, the emergency for the suspension of the constitution and by-laws of the Railway Signal Association has passed, and, subject to the approval of the Signal division, assembled in meeting March 15, 1920, effective March 18, 1920, the constitution of the Railway Signal Association will be again in force and the association will be, therefore, operated as an independent association and the Committee of Direction of the Signal division will assume the duties of president, vice-presidents, secretary-treasurer and Board of Direction of the Railway Signal Association and will arrange with the American Railroad Association for the restoration in all ways of the status which prevailed prior to the formation of the Signal Division of the American Railroad Association.

It is recommended that the Board of Direction be instructed to enter into negotiations with the officers of the American Railway Association to the end that an affiliation with it and the voluntary associations be entered into, if the American Railway Association so desires, this being an expansion of the present Section 5 of Article 7 of the constitution of the Railway Signal Association, which reads as follows:

"Section 5. The Board of Direction shall bring to the attention of the American Railway Association any and all findings, conclusions, specifications, or standards, especially those relating

to railway operation, which are, in its opinion, of sufficient merit and importance and which have been, or in the future may be, adopted by letter ballot, with the request that they receive such approval of the American Railway Association as may be consistent with the nature of the subjects."

The result of such negotiations shall be submitted to letter ballot of the Railway Signal Association as provided in the constitution.

During the morning a message was received from T. De Witt Cuyler, chairman of the Association of Railway Executives, requesting that the division take no action with reference to withdrawing from the American Railroad Association until after the reorganization of the A. R. A. was effected. This telegram was brought before the meeting during the afternoon session and the action taken at the morning session was then reversed, the association voting unanimously to table the action until after the reorganization of the A. R. A.

Resolution Offered by Mr. Eck

Resolved, That the action of the Committee of Direction, as set forth in the report of the chairman, namely: the making operative of the Railway Signal Association constitution and the assumption by the Committee of Direction of the Signal Division, Section II—Engineering, American Railroad Association, of the duties of president, vice-presidents, secretary-treasurer and board of direction of the Railway Signal Association, effective March 18, 1920, be approved and that the president be and hereby is instructed to advise the proper officers of the American Railroad Association that the Railway Signal Association is desirous of affiliating with the A. R. A. and the voluntary associations if requested so to do, under such terms as may be mutually decided upon subject to letter ballot of the Railway Signal Association.

C. H. Morrison (N. Y. N. H. & H.): The adoption of this resolution would be unwise. Perhaps our standing with the American Railroad Association has not been such as we desire, but I understand the American Railroad Association is being reorganized into the American Railway Association. There are no other associations that are separating from the American Railroad Association up to this time, and I understand that it is the desire of the American Railroad Association that we retain our membership in the association after it is reorganized.

I do not believe that we should be hasty in passing the resolution. It could be handled at our next meeting in July just as satisfactorily.

F. P. Patenall (B. & O.): It seems to me that the first part of the resolution suggests that we sever our connection with the American Railroad Association, and the last part intimates that we would like to remain with the association. I cannot see how the resolution can be put over in that shape. I believe we are making a grave mistake in attempting to pass this matter today. We all know that since the Signal division became a part of the American Railroad Association, the latitude extended to all its members has been much greater than under the old Railway Signal Association.

The American Railway Association as reorganized

will be the biggest organization in the world, and we ought to be proud to be affiliated with it. Until we know what action the American Railway Association expects to take in reference to the Signal division, this matter ought to be tabled.

C. A. Dunham (G. N.): I hope this meeting will see fit to support the resolution. I have many good reasons for expressing that wish.

When the Railway Signal Association ceased to function, and became the Signal division of the American Railroad Association, it was strictly a war measure. We were commanded by the general director of railroads to take such action; we had no alternative. Now that order has terminated, our old association again comes into life.

I am sure every man in this room will be glad to see the Signal division or the Railway Signal Association affiliated with the American Railway Association, but we want to affiliate in a proper way. The Signal division as it now exists has lost control practically of its own function. We are not in right. As a matter of fact we are distinctly in wrong, and we will not receive the recognition and the treatment which is our just due until we do establish an affiliation on a right and proper basis.

J. V. Hanna (K. C. Term.): I think it might clear the situation if we could have some explanation of the nature of this reorganization of the American Railway Association. Are we to understand that the American Railroad Association is dissolved as the result of the termination of federal control?

The Chairman: I don't think anybody knows. The American Railroad Association was formed by the director general of railroads, whose office has been abolished.

Mr. Smith: Since I have been working on committees I have felt that we have been able to do better work in the Signal division of the A. R. A. That association has lifted considerable work from the shoulders of various committees by furnishing secretaries, and doing a great deal of the work which we formerly had to do ourselves.

Why should we question what the American Railway Association is going to do? I think we would profit in the end by giving that association a chance to tell us whether it wants us or not.

Mr. Dunham: There may be a feeling in the meeting that in some way the action contemplated might prejudice our case with the American Railway Association, or with our own executive officers. I do not believe there is any occasion to anticipate that we will cease to receive the recognition and support and confidence that the Railway Signal Association earned in all the years past. We are able to stand on our own feet. The work of the R. S. A. has been carried out in a most exceptional and careful way. The findings of the association have been given very definite recognition, and I know of no voluntary railway association which has performed a relatively more useful work. It is true that the findings of the Signal division of the A. R. A. are referred to another and separate organization which is not affiliated with the American Railway Association, and until this separate and independent organization sees fit to do something



C. J. Kelloway
Chairman, Signal Division, A. R. A.

about the things that we recommend to them, they just lie there in a dormant state. Now, that is certainly not a satisfactory condition. Our work has been well performed, and recorded and put in due and proper form by this other association and there it ends. Heretofore, the findings of the R. S. A. have been carefully made, submitted to letter ballot, and official action taken; and the majority of the votes taken on such letter ballots were cast by the railroads. The representative membership in the R. S. A. had sufficient votes to carry or reject any problem before it. That was a truly representative association and it is something that we want to go back to in a proper and orderly manner. It is also desirable to retain a proper affiliation, as we have always had, with the American Railway Association.

J. A. Peabody (C. & N. W.): It is questionable whether any action is required on the part of this association at this time on the question, other than the recording of the fact that the matter was not submitted to the membership of the association for letter ballot as required by the constitution of the R.S.A. I will not criticize the action that was taken, because we were in a condition which controlled it largely. That condition, however, has passed, and it was only taken for the period of federal control. Therefore, no action really is required on this matter, but we would automatically become again the R.S.A.

As to an affiliation with the American Railway Association I believe that almost without question we must have such an affiliation. I do not know but that the members of the Board of Direction will desire to become actively affiliated with the American Railway Association, and will wish to make such recommendations. That can be accomplished better under our own rules and regulations than it can by leaving things to come out without any action on our part or without our being brought into consultation.

Someone said other associations were not going out. We have no facts on that. That is simply someone's opinion. We have not had time to investigate.

Mr. Hanna: If, as a matter of fact, the A. R. A. goes out of existence with the termination of federal control, there would seem to be no necessity for a resolution which dissolves the present relationship. If the director general's action in forming the A. R. A. did of itself terminate with the period of federal authority, we ought to know it. It seems that before the resolution is acted on we ought to have accurate and positive information on that point.

The Chairman: Order No. 70 did practically order this association to become part of the A. R. A. and says very definitely that it shall continue during the period of federal control; but federal control has ceased.

W. M. Camp: I think this association has some right of self-determination, and we all know that the changing of the R. S. A. over into the Signal division of the A. R. A. was done as a war emergency. It was not done by any letter ballot of this association. Inasmuch as the A. R. A. automatically went out of existence with federal control, in other words, has already gone out of existence, we automatically ceased to be the Signal division of the A. R. A. Undoubtedly it is a fact that some of the officers of the A. R. A. would like to retain this association in affiliation with that organization.

The latter part of the resolution, about which Mr. Patenall is in doubt, does not state that we go in again as a division, but that some working arrangement shall be made, and that working arrangement should be a matter carefully thought out and properly voted on, so that there is no question as to whether it is right and proper for this association to become again a division of the

A. R. A. It is time that this association should know under what rules it is working, and the best way to know that is to restore the constitution of the R. S. A.

J. C. Mock (Mich. Cent.): It would seem that this resolution is proper, because after getting back to our old organization we can then begin to negotiate. As it is now we have no method, no machinery, to do business with the A. R. A. in case they desire to have us affiliated with them. We are in a measure affiliated with them whether we wish it or not—the railroad organizations are all engaged in the same business.

A. H. Rudd (P. R. R.): I do not think that the statement that the A. R. A. has automatically ceased to function is correct. If so, where do we go from here, and who is going to pay the bills for this meeting that was called by the A. R. A.?

The R. S. A., as I understand it, still exists, and has existed throughout all this combination with the A. R. A. The Board of Direction terminated the affairs of the association by resolution and turned them over to the A. R. A. It had no authority to take that action, because, in order to amend or change the constitution, which was wiped out, a two-thirds letter ballot must be taken. It was the only action that could have been taken in the emergency, and the board was right in making the merger as an emergency measure and in suspending the constitution.

Since yesterday I have heard some men express the opinion if we took this action it might be considered discourteous to the officers and members of the A. R. A., the men for whom we work. Tactically we might be in better shape if we asked their opinion before we took any action.

Another way which might solve the proposition would be to appoint a committee to wait on the committee of the A. R. A. and ask advice. Let us put our cards on the table, with the proviso at this meeting that any action which they advise us to take would be by authority of this meeting submitted to a letter ballot. This is worth deciding and deciding right if it takes all day today and all day tomorrow.

Mr. Patenall: I wish to offer an amendment to the resolution to the effect that the Committee of Direction appoint a sub-committee to confer with the proper sub-committee of the A. R. A. and arrange for the future activities of the Signal division.

(Motion seconded.)

T. S. Stephens (A. T. & S. F.): I have always thought that some association like the American Railway Association should be formed, which would take in all the voluntary associations, co-ordinate and direct their action, and give them more authority than they could have as a separate organization. We want to have the executive officers of the American railroads understand things that we try to do, and I think in some way the R. S. A. should try to devise some orderly plan which will permit it to negotiate with the American Railway Association.

A. R. Fugina (L. & N.): Ever since the R. S. A. was absorbed by the A. R. A., I have never been able to get away from the idea that we were taken over in a sort of an illegal manner—we were in a measure confiscated. It was a war measure and now that war has ceased, it seems to me the only way to get at this thing is to get back on the original basis. We don't know whether the American Railroad Association wants the Railway Signal Association to join it. The affiliation was a war measure as far as it was concerned, and an order from the railroad administration. I don't think we need fear the A. R. A. and I don't think it will impugn our motives or question our honesty in the matter.

H. M. Sperry (representative of signal companies): It

seems that the big question is whether the R. S. A. wants to go into the American Railway Association or the American Railroad Association. The next question will be, how to do it. You have two courses to pursue, one, to restore the R. S. A. and the other to continue your present course, giving the A. R. A. a little time to find out where they stand and to find out what can be done.

Mr. Dunham: It is simply a question of correct procedure. The fact that this action of a year ago was taken as an emergency measure by order of the director general of railroads, and the further fact that this order has now terminated by reason of the suspended functioning of the director general, our constitution again becomes in force automatically, and this resolution before this meeting, if carried, is simply a statement of fact.

We do want to re-establish the R. S. A. and if the action taken today sustains the resolution offered by Mr. Eck, then we are in a good position to negotiate and go forward any time with our work. If the amendment were to carry I can readily see that developments may take place in the next two or three months wherein it would be nearly impossible for this association to re-establish its true and proper function.

Mr. Patenall: I offered this amendment for the reason that if we expect to get anywhere in the future we must confer with the people who dictate the policies of the railroads in this country. There is nothing that I have said or thought, so far as I know, which would lead you to believe that there was no R. S. A. Nothing has transpired which has wiped that out of existence. I cannot agree to statements that our activities have been restricted.

A. B. Du Bray (I. C. C.): It has been stated that since we have been members of the A. R. A. we have gotten better results with our work. Probably we have done better committee work, but I think we are after final results. Since we have been members of the A. R. A., nothing has been published in our Manual; and as it stands now, nobody knows whether we ever will.

R. B. Elsworth (N. Y. C.): Will the Secretary please explain in what way the A. R. A. has prevented the printing of our approved specifications and standards in the Manual?

The Secretary: The regulations under which we are operating, as the Signal division of the A. R. A., gives us the privilege to place before the members of the Signal division the standards that we desire to adopt. Those standards which were adopted in September and December, 1919, were submitted to you by letter ballot, and they passed with a satisfactory vote. They are now, so far as the division is concerned, the standards as recommended by the membership of the Signal division. Before these standards can be placed in the Manual, the General committee, Section II, Engineering, A. R. A., must pass upon them. That body is our executive committee, so to speak. I anticipate that that committee, which will meet Tuesday evening, March 16, will accept those standards. If the General Committee approves the standards, they will be passed to the Executive committee of the A. R. A., for it to declare that they will become the authoritative document of the A. R. A. I anticipate until that action has been taken that we will not get permission to publish them.

Mr. Eck: Will the secretary please say what will become of those standards under present conditions if the Executive committee decides not to approve them?

The Secretary: The General committee, made up of representatives of various sections of the A. R. A., would have a voice in this matter. If they disapprove of our work, it is my opinion that we are still in a position to use the literature which appears in the Manual as recom-

mended practice. However, in that case, it does not become an obligation on the part of the railroads to use it. We have nothing in our literature today that indicates that the matter now published in the Manual is obligatory any more than what has appeared in the recommendations of the R. S. A.

Mr. Rudd: If these standards, approved by the Signal division, are passed on by the various committees of the A. R. A. and also by the Executive committees of that association, are they, in that case, obligatory on the railroads to use them? As I understand it the A. R. A. is recommendatory, the same as the R. S. A. was recommendatory, but the A. R. A. recommendations, of course, have a great deal more force than the recommendations of the R. S. A.

The Secretary: The A. R. A. does not make it obligatory on the part of the railroads to use the standards I am talking about. The recommendations of the A. R. A. have been, and probably will be, on the same basis as those of the R. S. A.

The Chairman: The Chair thinks the amendment is out of order at this time, and that the original motion should be voted upon. (This was done and carried.)

Mr. Patenall: I will offer my amendment as an independent motion.

Mr. Dunham: I propose to amend the motion to the effect that the committee, if appointed as contemplated by the motion, shall be authorized to express a hearty and cordial willingness to co-operate with the A. R. A. in such way as they may desire.

Mr. Patenall: I do not think it is necessary to express our desire to co-operate, for we will probably be told to do so.

F. W. Bender (C. of N. J.): I move that the motion made by Mr. Patenall be laid on the table.

(Motion seconded and carried.)

Later in the day, during the afternoon, the question was reopened by A. H. Rudd, who read the following telegram addressed to H. S. Balliet, secretary Signal Division A. R. A., from Thomas DeWitt Cuyler, chairman of the Association of Railway Executives:

"The Association of Railway Executives have under consideration plans for carrying on the work of the American Railroad Association. Until these have been matured the executives earnestly advise against dissolving the consolidation of railroad activities brought about during the war through the American Railroad Association and deprecate any increase at this time in the number of separately maintained railroad organizations. Sincerely hope you will postpone proposed action."

In the face of that message, I move the reconsideration of the motion passed at the morning session.

(The motion was duly seconded, and carried.)

Mr. Rudd: I offer the following resolution:

Resolved, That the action taken authorizing the re-functioning of the Railway Signal Association, effective as of March 18, 1920, be rescinded; that at the request of the Association of Railway Executives action be postponed, and that the Committee of Direction be, and hereby is, instructed to appoint a committee to confer with the proper committee of the Association of Railway Executives or the American Railroad Association as to future procedure, having in view the previous action, hereby rescinded, which expresses the views of the members of the division.

Mr. Dunham: Will it be in order for this meeting to indicate something as to the personnel of this proposed committee? I am entirely agreeable provided we can have the right kind of committee. Otherwise I am wholly opposed to it.

Mr. Mann: I have rather lost confidence in the com-

mittee. I am like Mr. Dunham—if we know who is put on the committee, then we will know what is going to happen.

Mr. Dunham: The American Railroad Association has taken it upon itself to appoint men on very important committees to this division without the knowledge or approval of the Board of Direction of the division, and without the knowledge of the chairman of the division, if I am correctly informed. Now, then, if that be true, I think on behalf of the parent body, if they want to have a committee that will agree with them perfectly, that I could name two or three men here who would straighten the whole thing out to their entire satisfaction, but that would not be satisfactory to this division.

C. E. Denny (N. Y. C. & St. L.): This telegram asks that no action be taken pending the reorganization of the American Railroad Association. There is no bigger body, from the railroad standpoint, in the country today, than the Association of Railway Executives. They are handling everything of importance. I believe that they will attempt to correct any matter of organization that has been ineffective or obnoxious to the Signal division and that they will put it in the proper place in their organization if all the facts are laid before them. It appears entirely reasonable to say, when requested by them, that we will withhold taking any action at this time.

B. H. Mann: What we want is a little more democracy. We should have it known that as far as this association is concerned, we feel confident to run the signal business as far as the designs go. Of course, we do not undertake to control policies. Anything that is handled in this association should be put up to a representative body before it is finally executed.

Mr. Fugina: The Board of Direction represents the association. I do not know of a more representative committee we could have than the Board of Direction. We are practically turning it down when we insinuate that their motives are not proper.

Mr. Dunham: The parent body has placed certain men in certain positions for us. That has been done before, and if it is done again, I can see where this signal association gets off.

Mr. Stephens: I believe when DeWitt Cuyler asks us to do something he will see that we are not thrown down.

The Chairman: Will Mr. Rudd read the resolution as he now desires to offer it?

Mr. Rudd: The resolution as now presented is as follows:

"Resolved, That the action taken authorizing the re-functioning of the Railway Signal Association effective as of March 18, 1920, be rescinded; that at the request of the Association of Railroad Executives action be postponed, and that the Committee of Direction be and hereby is authorized to confer with the proper committee of the Association of Railway Executives or the American Railroad Association as to future procedure, having in view the previous action, hereby rescinded, which expresses the views of the members of the Signal division."

(The motion adopting the resolution was unanimously carried.)

Mr. Rudd: I move that the secretary be authorized to advise Thomas DeWitt Cuyler, chairman of the Association of Railway Executives, of the action which was taken this morning, and also the action taken this afternoon.

(The motion was duly seconded and carried.)

Report of Committee XV—Valuation

THE COMMITTEE SUBMITTED for consideration at the meeting a report on the average life in years of the important units of the different types of signal installations and on the study of the Joint Signal Committee of the President's Conference Committee and the Bureau of Valuation of the Interstate Commerce Commission as to labor costs to establish percentage to be added to material to arrive at total cost of installation.

Progress Report on Table of Average Service Life

A list of approximately 100 major units of signal installations was prepared and sent about November 20 as an inquiry (form Inquiry SD 1) to 152 railroads for records and opinions as to the maximum life of these units, separating physical from functional depreciation.

Up to January 10, 33 replies had been received, representing approximately 61 railroads, 7 of which gave no information, and a large percentage of the balance gave only opinions which differed widely. The committee feels that until more information is obtained, a report would be unwise.

Relation of the Cost of Labor and Material for Installation of Crossing Bells

The committee obtained cost data for the installation of crossing bells to the amount of approximately \$40,000 for 77 different installations and recommended as an extension of the study by the Joint Committee of Signal Engineers and representatives of the Interstate Commerce Commission the following:

As a guide for estimating the cost of "reproduction new," supplementing the table of schedules shown on

page 36, Vol. 3, of the report of the Joint Committee on Signaling and Interlocking, a percentage of from 45 to 65 shall be added to the cost of material f. o. b. shipping point, to cover the labor of installation of crossing bells.

The committee asked that the data presented be accepted as information.

Committee: J. M. Carley (B. & A.), chairman; P. M. Gault (I. C.), vice-chairman; R. B. Arnold (C. & N. W.), F. H. Bagley (L. & N.), G. E. Beck (N. Y. C.), P. F. Canfield (N. Y. N. H. & H.), J. C. Finch (Mo. Pac.), C. O. Glenwright (P. L. W.), W. H. Harland (I. C. C.), C. Homewood (P. R. R.), W. Hudson (N. Y. C.), J. C. Irwin (B. & A.), Geo. W. Kydd (B. & O.), F. A. Leonard (I. C. C.), J. W. MacCormack (K. C. T.), J. P. Robinson (S. P.), C. H. Wiegand (A. C. L.), E. E. Worthing (S. P.), J. P. Zahnen (C. R. I. & P.).

Discussion

P. M. Gault (Vice-Chairman) presented the report of the committee.

A. B. Du Bray (I. C. C.): I ask whether the committee means by crossing bells to include all highway crossing protection, such as wig-wags and any other visible as well as audible signals?

Mr. Gault: The committee will include wig-wags or any other signals.

Mr. Du Bray: It seems to me that in many cases the percentage of 45 is considerably too high.

Mr. Gault: In the percentages as shown, 45 is the lowest. It was found by the committee that the cheapest installation would cost 45 or more, and a range of 20 per cent was given, 45 to 65.

Mr. Du Bray: I have found installations where 30 per cent fully covered it, and I think the percentage should

start lower. The high range is proper, but we should be able to get a lower range if the facts show that there is a need for it.

Mr. Gault: As I understand it, in the joint report, covering mechanical interlocking, a range of 40 to 50 per cent is allowed. No doubt many installations cost

less than 40 per cent, and others cost more than 50 per cent. This range will cover the great majority of installations.

On motion, the report was accepted as information and the committee dismissed with the thanks of the association.

Report of Committee VI—Standard Designs

THE COMMITTEE PRESENTED 13 drawings; 5 of which are revisions of drawings previously presented and 8 are new designs.

The following revised and new drawings were submitted and the committee recommended their approval as standard, for submission to letter ballot for inclusion in the Manual:

1082—Mechanical Semaphore Bearing and Details. Revised.

1084—Pipe Carrier Side. Revised.

1085—Pipe Carrier Details. Revised.

1194—Mechanical Semaphore—Detail and Assembly. Revised.

1399—Low Target Stand. Revised.

1440—Switch Lamp (Spherical Type). New.

1441—Switch Lamp (Spherical Type) Base Socket. New.

1442—Lens Hoods and Couplings for Switch and Semaphore Lamps. New.

1443—Oil Fount for Spherical Type Lamp. New.

1496—Highway Crossing Gate and Slow Track Sign—Lamp Hanger. New.

1497—Highway Crossing Gate Lamp Fount and Lens Hoods. New.

1498—Highway Crossing Lamp Handle and Alignment Clamp. New.

1499—Highway Crossing Gate Lamp. New.

Committee: F. P. Patenall (B. & O.), chairman; J. C. Mock (M. C.), vice-chairman; W. A. Hanert (N. Y. C.), C. J. Kelloway (A. C. L.), B. H. Mann (Mo. Pac.), F. W. Pfleging (U. P.), W. N. Spangler (P. R. R.), M. E. Smith (D. L. & W.), T. S. Stevens (A. T. & S. F.).

Manufacturers' Representatives: R. W. Hewes (Fed. Sig. Co.), W. P. Neubert (U. S. & S. Co.), C. G. Harwig (Hall S. & S. Co.), S. N. Wight (G. R. S. Co.).

Discussion

F. P. Patenall (chairman) presented the report.

On motion, plan 1082 was approved for submission to letter ballot to be included in the Manual.

Mr. Patenall: I move similar action with regard to plans 1084 and 1085.

C. F. Stoltz (C. C. C. & St. L.): Has the committee considered any other method of holding the top roller in; has it considered the number of carriers in use in adopting a standard top roller, and has it considered the cost of these as against some other method of holding the top roller?

Mr. Patenall: I do not know that the committee went very deeply into the question of the number of carriers in service with this type or any other type. The method of securing the top roller may be fairly good; in fact, better than quite a number of others we have had to do with, and if Mr. Stoltz has any other design in mind the committee will be glad to consider it if it is any better.

Mr. Stoltz: The design I have in mind is of the top strap type, that can be used where it is necessary to add another unit. A unit of the type presented cannot be added to a line using the top staff. Would the committee be adverse to specifying both, so that we can attach them to the existing lines?

Mr. Patenall: It is an additional part, and for that

reason would mean greater cost. It is difficult to make a standard that will admit of all types of apparatus being applied to it.

Mr. Patenall: Plan 1194, Mechanical Semaphore. This plan shows an addition to the oil cup. I move that the details and assembly of the mechanical semaphore bearing be submitted to letter ballot and if adopted be included in the Manual.

C. A. Christofferson (N. P.): I think the committee should add to the description of the oil cup, that the cap for it should be designed in such a manner it cannot be easily taken off.

Mr. Carter: It is a difficult proposition to take any of these commercial oil cups and use them out of doors and have them absolutely water tight.

Mr. Patenall: I think we must leave it to the signal engineers to decide on what type of oil cup he will use and simply describe the means of closing the oil hole.

(The motion with regard to plan No. 1194 was carried.)

Mr. Patenall: The committee asks the approval of plan 1399 on Low Target Stands.

Mr. Dunham: I think the stand shown on the plan will work out all right if used on oak ties, but in certain sections of the country oak ties are no longer available and for that reason I think that the 3/4-in. by 4-in. lag screw is all right.

(Motion to approve plan 1399 carried.)

Mr. Patenall: The committee moves the approval of drawing No. 1440, Switch Lamp, spherical type, for submission by letter ballot, to be included in the Manual.

(Motion seconded.)

Mr. Dunham: The drawing shows 5 3/8-in. lenses on all four sides of the lamp. I am sure there are a number of men in this room who hold that different colored lenses should not be of one size. The manufacturers will tell you that it is wrong to make the lenses all the same size. A mistake of a man in placing a lens might easily result in a bad accident on your railroad. If the lenses are made of different sizes that imposes a mechanical check, wherein it will not be possible to transpose the lenses, and thereby produce a wrong signal indication.

Mr. Hobson: Any tramp can change the lenses in this proposed standard switch lamp; all he has to have is a screw driver or a broken-bladed knife. A switch lamp with two different size lenses make this an impossibility.

Mr. Ralph: At some previous meeting I brought up the point of allowing for the ordering of different designs of lenses, and I think the chairman of the committee said that would be taken care of.

Mr. Christofferson: We should stick to the old practice of different sizes for red and green, and I certainly would not like to see this go to a vote and be put in the Manual.

Mr. Dunham: A 5 3/8-in. lens is the desirable red lens; perhaps a larger one would be better, but certainly a smaller one will not be equally satisfactory. If we wish to retain different sizes for different colors, perhaps 5 in. for the green is the next available size. I move an amendment to the motion that this meeting vote against the

adoption of the plan as it is now drawn, providing for one size of lens in all four openings of the lamp.

(Motion seconded.)

Mr. Patenall: It does not seem that this association should put itself on record as being in favor of a switch lamp which will require lenses of different sizes, and I hope the association will vote down that amendment.

T. S. Stevens (A. T. & S. F.): I don't believe we should assume that the color of the lens which is being used for a certain purpose on a railroad is not going to be checked up. We should assume that that is going to be done. I assume the only way to get a change in the diameter would be to make the green lens smaller than the red.

Mr. Dunham: We can retain, if it is necessary, the 5 $\frac{3}{8}$ -in. green and use a larger red lens. There are thousands of men employed on the railroads today who are not able to read the printed instructions issued for their guidance, and it is perfectly easy to introduce a mechanical safeguard that will take care of this vital consideration.

W. K. Saunders (R. F. & P.): On our road we use only one size lens, and we never have any trouble from men getting the wrong glasses in the wrong place. Our men are mostly colored men. I am in favor of the committee's recommendation.

(Amendment lost.)

(The original motion on drawing 1440 carried.)

Mr. Patenall then presented Drawing 1442, lens hoods and couplings, and moved its adoption.

Mr. Ralph: I believe this hood is wider than called for at the last meeting. It is shown in drawing 1440 as projecting over the lamp the full face of the lens.

Mr. Patenall: It is not the intention of the committee to have any different hood. The committee feels that $\frac{7}{8}$ in. is a reasonable width to make the lens hood, and unless you can make the hood very much wider the assumed protection is negligible.

Mr. Hobson: My suggestion would be that we do away with the hood entirely, as it is not needed.

Mr. Dunham: If the hood is used as the drawing shows it provides a lodgment for snow and will frequently reduce the amount of light possible to get through the lens.

Mr. Dunham: I move that there is no necessity for hoods over the lenses used in such lamps as semaphore lamps, marker lamps, classification lamps, and platform lamps, if used.

(Motion to adopt Drawing 1442 lost.)

Mr. Patenall: The committee recommends that Plan 1443, covering oil founts, designed to meet Drawing 1442, be submitted to letter ballot for inclusion in the Manual.

Mr. Dunham: What is the oil capacity of the fount as shown in Plan 1443, and what difference is there in oil capacity from the fount we are now using?

Mr. Patenall: The founts are practically the same as to capacity, 31 ounces.

(Motion regarding Plan 1443 carried.)

Mr. Patenall: Drawings 1496, 1497, 1498 and 1499.—The first plan, 1496, shows the hanger for a highway crossing gate and slow track sign lamp. It was moved that the plan be approved for submission to letter ballot for inclusion in the Manual.

(Motion seconded.)

Mr. Jacobs: On plan 1499, I assume that you include the hood on the lamp.

Mr. Patenall: Mr. Dunham in his remarks asked that hoods be discontinued, but did not include crossing gate lamps. There seems to be every reason why the crossing gate lamp should have a hood. One of our pur-

poses in the past has been to prevent the red rays displayed to the roadway being so displayed as to come within the line of the engineer's vision.

Mr. Ralph: The committee has called for lenses on Drawing 1499. It is a mistake not to allow for the use of roundels, for they are higher, which is quite an item on long gates, and they are cheaper.

Mr. Peabody: I notice that this lamp is to be fastened on with a cotter. Now, ordinarily, lamps are removed by the gateman every day for cleaning, and that means that the cotter will be removed and put back in place twice each day. This is something that has to be done practically with a pair of pliers, with which we do not care to equip our gatemen, and we would also have to give them a supply of cotters.

Mr. Patenall: The committee has already agreed that that was the most practical way to do it. It is possible to have a long cotter, with a reasonable amount of spring to it, that anyone could, without the use of tools, pull out and put back.

(Motion regarding No. 1496 approved.)

Mr. Patenall: Plan 1497 shows a highway crossing gate lamp fount and lens hood. Our attention was called to the fact that the fount was really of 9-oz. capacity. We discussed the necessity of having lights burn for longer than 12 hr., and came to the conclusion that even with that comparatively small capacity fount there is sufficient oil to last at least 16 hr. The committee recommends the 9-oz. fount.

Mr. Peabody: The discussion about this fount was entirely with reference to the use of this lamp as a gate lamp, and as such that fount is sufficient, but as a lamp for slow speed signs, it is not.

Mr. Patenall: If a fount will hold sufficient oil, and burn a long enough time on a gate, then that fount also will fulfill the requirements of a slow track lamp.

Mr. Peabody: A gate lamp is taken care of by a gate man who can take care of it daily, while a slow speed lamp is taken care of by a lamp man, who is also taking care of switch lights and signal lights. These founts should have a capacity so that the lamps will burn practically the same length of time.

Mr. Smith: The design of a fount, and also burners, may depend upon the specifications for illuminating oil, relative to sizes, and to how long before the oil burns out. I would like to know if the committee has had that under consideration.

Mr. Patenall: The committee did not consider anything in reference to the quality of oil, that is, whether a longer burning time can be secured out of the oil than we have in the past.

Mr. Mock: Thirty-one ounces of oil will burn 120 hr. in a common oil burner. With 9 oz. you would naturally expect about that proportion, and under those conditions you would get at least 31 hr., which is a sufficient margin for one day.

(Motion regarding No. 1497 approved.)

Mr. Patenall: Plan 1498—Highway Crossing, Lamp Handle and Alignment Clamp. The committee asks approval, for submission to letter ballot, and inclusion in the Manual.

(Motion was duly seconded and carried.)

Mr. Patenall: The committee presents No. 1499, Highway Crossing Gate Lamp, and recommends submission to letter ballot and inclusion in the Manual.

(Motion seconded.)

Mr. Stoltz: The matter of the use of roundels instead of lenses was brought up earlier in the discussion. I understand the committee will take that under consideration, although the plan does not show that they have given it consideration. I recommend the elimination of

the peep-hole in the crossing gate lamp. It is not necessary.

Mr. Peabody: I make an amendment to the motion to be changed to read: lenses, roundels, one red four inch. (Amendment seconded.)

The Chairman: The committee will agree to show the alternative.

Mr. Peabody: I do not wish it as an alternative. I wish it there as a parallel proposition, with lenses.

Mr. Patenall: I don't understand, Mr. Peabody. You don't want to insist that roundels be shown on this drawing as a standard, but rather as an alternative standard, so that you can use a roundel and I can use a lens.

Mr. Peabody: I am satisfied with that idea, but if you put it as lenses primarily, alternative, roundels, it means that the roundels are on the weak side of the proposition.

Mr. Patenall: I do not know whether this committee would be willing to simply put them both on the same basis.

(Mr. Peabody's amendment was adopted.)

Mr. Peabody: I make a motion that the note at the bottom of the drawing reading: "This lamp may be used to indicate 'slow track,' lenses of proper color being used," shall be eliminated.

(Motion seconded, but on being put was lost.)

(Plan 1499 was approved, to be submitted to letter ballot, for adoption and inclusion in the Manual.)

Mr. Mann: We have adopted a motion that we shall not put any shields on the lenses. Mr. Ralph says that practically a railroad has anywhere from a one-degree curve to a 14-deg. curve. What would the committee do if I should put a switch lamp on the end of a 14-degree curve?

Mr. Patenall: I want to make a motion that will rescind the action taken in reference to lens hoods, and if that carries I want to make another motion which will require that lens hoods be furnished with such lamps. I move that we reconsider and rescind our previous action in the matter of lens hoods.

Mr. Dunham: The main reason for putting a hood over a lens was to protect it against damage while being carried. Such lamps are not carried around as they have been in the past. They are generally fitted with long time burners and stand on the switches all the time. Then, too, we have solid-colored lenses, so that in the case of a little chipping on the lens, there is no special objection to it.

Mr. Ralph: I consider the hood of more value in stopping any side view of the lens than it offers in preventing chipping of the lens. They are of great value on semaphore lamps, as well as switch lamps, on a junction.

(Motion to reconsider carried.)

Mr. Patenall: I move that lens hoods be provided for all switch lamps and crossing gate lamps.

(Motion, after being seconded, carried.)

Mr. Du Bray: Are we to understand by the last vote that we have adopted the hood shown on drawing 1442?

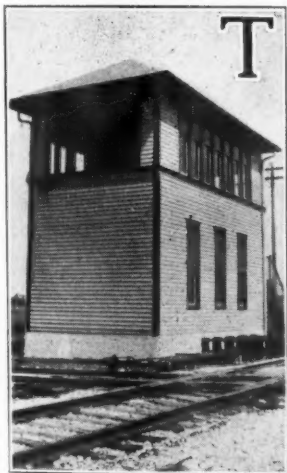
Mr. Patenall: That plan was eliminated by popular vote, and in view of the last action I move that that action be reconsidered.

(The motion carried.)

Mr. Patenall: I recommend for approval drawing No. 1442, Lens Hoods and Couplings for Switch and Semaphore Lamps, for submission to letter ballot and inclusion in the Manual.

(Motion, after being seconded, was carried.)

Report of Committee II—Mechanical Interlocking



THE COMMITTEE presented reports on specification for mechanical interlocking machine, style "A" locking, and mechanical machine lever locking.

The committee recommended that the specifications for mechanical interlocking machine, style "A" locking, be accepted for presentation at the annual meeting for submission to letter ballot and inclusion in the Manual and that the same action be taken with the specification for mechanical machine lever locking.

The specification for mechanical interlocking machine, style "A" locking, follows:

1. REQUISITE SHEET

(b) Where blanks have not been filled in, or where an option is permitted and no preference stated, the Contractor's recommended practice shall be followed. (S.S. 4-b.) 1919.

(c) Requisite sheet for mechanical interlocking machine attached to this specification, shall form a part thereof. 1920.

2. GENERAL

(a) Levers shall be numbered from left to right. 1916.

(b) Machine legs, extension legs, bottom girders, front and back girders, lever shoes, quadrants, locking plates, rocker links and counterweights shall be made of cast iron. Quadrants and rocker links shall not provide for treadle, unless otherwise specified. 1920.

(c) Latch shoes, latch handles, tappet jaws, bottom girder caps and combined lever number and foot plates shall be made of malleable iron. 1920.

(d) Levers, tail levers, lath rods and locking plate strips shall be made of open hearth steel. 1920.

(e) Front guides, latch lock rollers and studs, locking tappets, longitudinal locking bars, tappet connecting links, rocker guides, locking dogs and all pins, shall be made of cold drawn steel.

(f) Swing dogs shall be made of { hard brass.
steel. 1920.

(g) Latch springs shall be made of spring steel wire. 1919.

(h) Latch blocks shall be made of { cast steel.
forged steel. 1920.

(i) Machine shall consist of one, four and eight-lever sections. 1919.

(j) On machines having four-lever section, the four-lever section shall be placed on the right hand end of machine, one-lever section may be placed on either end of the machine. 1919.

(k) Levers shall be spaced five inches center to center. 1919.

(l) Height of machine from bottom of leg to top of front and back girders shall be 4 ft. 9½ in. 1920.

(m) Like parts of same manufacturer's machine shall be interchangeable. 1919.

(n) Spare levers shall be complete with rockers, tappet links and tappets. 1920.

(o) Each spare space shall be equipped with quadrant, cap and pin for lever shoe. 1920.

(p) Bolts and screws shall have U. S. standard threads, unless otherwise specified. 1919.

(q) Nuts, bolts and cap screw heads shall be hexagonal, unless otherwise specified. 1919.

(r) Bolts and cap screws, except for locking caps, shall be provided with spring lock washers where practicable. 1919.

(s) Taper dowel pins shall be No. 8 standard Morse 2 in. in length and No. 6 standard Morse 1 $\frac{3}{4}$ in. in length. 1920.

(t) Straight dowel pins shall be No. 12 drill rod. 1920.

(u) When necessary to hold parts in fixed relation to each other, dowel pins or body bound bolts shall be used. 1919.

(v) Moving parts of machine shall work freely without lost motion. 1919.

(w) All parts of machines shipped knocked-down shall be marked with steel figures on a finished surface and given the numbers they take in the assembled machine. Numbers shall be visible in the assembled machine where practicable. 1920.

(x) Locking tappets, tappet jaws, tappet connecting links and rockers shall have their lever numbers marked on the front. Longitudinal locking bars shall have their lever and space numbers marked on front at end of bars. 1920.

(y) Machine shall be painted in accordance with R.S.A. specification for shop painting. 1919.

3. MACHINE LEGS

(a) Machine legs shall be in accordance with drawing No. 1920.

(b) Extension legs shall be 2 ft. 3 in. in height and provided with 8 holes for $\frac{3}{4}$ -in. bolts and shall be fastened to machine legs with four $\frac{3}{4}$ -in. bolts and two No. 8 dowel pins. 1920.

4. GIRDERS

(a) Bottom girders shall be fastened to machine legs with two $\frac{3}{4}$ -in. body bound bolts. 1920.

(b) Caps shall be fastened to bottom girders with two $\frac{5}{8}$ -in. square head bolts. 1920.

(c) Front and back girders shall be fastened to machine leg with two $\frac{5}{8}$ -in. bolts and one No. 8 dowel pin at each end. 1920.

5. QUADRANTS

(a) Quadrants shall be provided with lug drilled for 1-in. diameter pin for the support of rocking links and shall be fastened to back and front girders with two $\frac{5}{8}$ -in. tap bolts. 1920.

(b) Quadrant plates shall have a 1-in. by 1 $\frac{1}{2}$ -in. opening back of each lever to clear connecting rod for electric lock or circuit controller. 1920.

6. LEVERS

(a) Levers shall be 5 ft. 10 $\frac{7}{8}$ in. from center of fulcrum to end of handle. 1920.

(b) Levers shall have equal and uniform throw and shall be in true alignment when in normal position. 1919.

(c) Tail levers shall be $\frac{3}{4}$ -in. by 2 $\frac{1}{2}$ -in., drilled to provide 8 $\frac{3}{4}$ -in. stroke, 9 $\frac{3}{4}$ -in. stroke, 10 $\frac{3}{4}$ -in. stroke and shall be interchangeable as front or back tail levers. 1919.

(d) Lever shoes shall provide equal stroke above and below horizontal and so arranged that connections can be made to front or back tail levers. 1920.

(e) Levers shall latch in normal and reverse positions, also in the center position when specified. 1920.

(f) Levers and tail levers shall fit snugly into lever shoes and each shall be fastened thereto with two $\frac{3}{4}$ -in. c.s.k. featherhead bolts and one No. 8 dowel pin in lever only. 1920.

(g) Lever shoe pins shall be 1 $\frac{1}{2}$ -in. diameter. End pins shall be held in place by one $\frac{3}{8}$ -in. square head cup point set screw through girder cap. 1920.

(h) Latch shoes shall be in accordance with drawing No., and shall be fastened to lever with two $\frac{5}{8}$ -in. tap bolts and one No. 8 dowel pin. The hole for dowel pin to be located below the hole for the lower tap bolt. 1920.

(i) Rocker links shall be in accordance with drawing No., and shall be fastened to quadrant with one 1-in. diameter grooved pin. The pin to be held in place with one No. 14 fillister head screw through quadrant. 1920.

(j) Rocker links shall be designed to give tappet one-half stroke for full movement of latch block from normal or reverse position to top of quadrant; and no movement of the tappet when lever is moved between normal and reverse position. 1920.

(k) Rocker link guide shall be fastened to the lever with two $\frac{3}{8}$ -in. by 1 $\frac{5}{8}$ -in. rivets. Holes for rivets to be drilled in a vertical plane in the center of lever. 1920.

(l) Rocker guide shall be in accordance with drawing No. 1920.

(m) Latch rods shall be $\frac{5}{8}$ -in. by 25-in. from center of

eye to end of thread, thread to be $\frac{5}{8}$ -in. S.A.E. standard 18 threads to the inch, 2 $\frac{1}{4}$ -in. long. 1920.

(n) Latch springs shall be 11/16-in. inside diameter and shall be of proper strength to operate the locking tappets in compression by the adjustable bushing when the lever is at either end of the quadrant and the latch is free to drop. 1920.

(o) Latch handles shall be 10-in. from center of hole to end of handle and shall be connected to lever and latch rod with two $\frac{1}{2}$ -in. round cheese head pins. 1920.

(p) Combined foot and number plates shall be fastened to levers with $\frac{1}{2}$ -in. round cheese head pin. 1919.

7. LOCKING

(a) Machine shall be provided with mechanical locking of the preliminary type. 1911.

(b) Locking bed shall be made up of not less than two 4-space locking plates providing nine spaces for locking, unless otherwise specified. 1920.

(c) Locking plates shall be designed to accommodate front and back locking and shall be fastened to machine legs with four $\frac{3}{8}$ -in. cap screws and four No. 6 dowel pins. 1920.

(d) Locking shall be placed on the {front
back} of machines. 1920.

(e) Locking shall be distributed as uniformly as possible without crowding. 1919.

(f) Tappet jaws shall have 1 7/16-in. offset and shall be fastened to tappets with two $\frac{3}{8}$ -in. cap screws. 1920.

(g) Tappet connecting links shall be 22 $\frac{7}{8}$ -in. from center to center of holes and shall be connected to tappet jaws and rocker links with two $\frac{3}{4}$ -in. round cheese head pins. 1920.

(h) Tappets shall be $\frac{1}{2}$ -in. by 2-in. and shall have 1 1/16-in. stroke. 1920.

(i) Front locking guides shall be fastened to locking plates with two No. 14-24 round head screws. 1920.

(j) Locking plate strips shall be fastened to locking plates with two No. 14-24 round head screws. Sufficient strips shall be furnished to properly support front locking. 1920.

(k) Swing dogs shall be fastened to tappets with one $\frac{3}{8}$ -in.-30 special steel screw U.S.F. thread. 1920.

(l) Front and back locking dogs and carriers shall be fastened to locking bars with two No. 10-32 A.S.M.E. special steel {screw
stud} and sufficient carriers shall be put in to support longitudinal locking and shall be so placed that the drilling will be interchangeable with standard dogs. Splicing couplings shall be fastened with four screws or screw studs, as mentioned above. 1920.

(m) Tappet pieces shall be fastened to tappets with two No. 14-24 fillister head screws and two No. 12 by 15/16-in. drill rod dowel pins. 1920.

(n) Splicing in longitudinal bars shall be made with splicing couplings. Splicing in longitudinal bars shall be avoided as far as practicable. 1920.

(o) Latch rods in locked combination shall not have a lift of more than 3/16-in. 1919.

8. MATERIAL AND WORKMANSHIP

Material and workmanship shall be first class in every respect. (G.P. 8-a.) 1911.

9. INSPECTION

(a) Purchaser may inspect the material at all stages of manufacture. (S.S. 6-a.) 1919.

(b) Purchaser may inspect the completed product to determine that the requirements of this specification have been met. (S.S. 6-b.) 1919.

(c) If the material has not been accepted at point of production and if, upon arrival at destination, it does not meet the requirements of this specification, it may be rejected and the Contractor, upon request, shall advise the Purchaser what disposition is to be made of the defective material. The Contractor shall pay all freight charges. (S.S. 6-c.) 1919.

(d) If Purchaser is to make inspection at point of production, it shall be so stated. (S.S. 6-d.) 1919.

10. TESTS

(b) Contractor shall give the Purchaser sufficient notice of time when material will be ready for testing. (S.S. 7-b.) 1919.

(c) Contractor shall provide at point of production, apparatus and labor for making the required tests under supervision of the Purchaser. (S.S. 7-c.) 1919.

(d) A force of not more than 200 lb. may be applied to ends of latch handles when testing for lift of latch rods of locked combinations. 1920.

(e) Locking may be tested at point of production or at destination. 1920.

11. PACKING

(a) Material shall be so prepared as to permit convenient handling and to protect against loss or damage during shipment. (S.S. 8-a.) 1919.

12, Marking, and 13, Warranty, consist of standard sections applicable to various specifications.

Mechanical Machine Lever Locking

1. DERAILS

(a) Locking shall be provided between derail levers in conflicting routes. Each derail lever shall lock all trailing point switch levers in the route, except those held by switch locking, unless otherwise specified. 1920.

2. SWITCHES

(a) Locking shall be provided between switch levers when additional protection may be secured. 1920.

(b) Movable and wing frogs shall function the same as switches. 1920.

3. FACING POINT LOCKS

(a) Levers operating facing point locks that lock switches only, shall lock the switch levers in both normal and reversed positions. 1920.

(b) Levers operating facing point locks that lock switches and derails in combination shall lock the switch and derail in both normal and reverse positions. 1920.

(c) Levers operating facing point locks that lock derails only, shall lock the derail levers in the reverse position only, unless otherwise specified. 1920.

4. SIGNALS

Each signal lever for the route or routes to be governed shall lock facing point lock levers reversed; derail levers reversed (except those locked reversed only by facing point locks), switch levers in proper position (except those locked by switch or derail locking), and conflicting derail and signal levers not otherwise locked. 1920.

5. CHECK LEVERS

Check lock levers shall be locked by signal levers routing to the section of track for which check locking is provided. Check lock levers shall be locked in the normal position by signals routing in the preferred direction of traffic and in the reverse position by signals routing against the preferred direction of traffic. 1920.

6. SPECIAL LOCKING

(a) Special locking { shall } be required on account of section or route locking as follows:

1. Signals on the same track { shall } be locked so as to permit traffic to approach from both directions simultaneously to opposing signals. 1920.

2. Signals { shall } be locked in reverse position by signals leading up to them.

(b) Signals at cabin door lock interlockings and interlockings which are unattended a part or all of the time shall be arranged for normally at proceed for opposing movements on one route at a time. 1920.

7. RESTRICTIONS

(a) Direct locking shall be used wherever possible. 1920.

(b) Butt locking shall be avoided as far as possible. When used with style "A" machine, butting dogs should be used where practicable. 1920.

8. APPROVAL

(a) Locking sheet and dog chart shall be approved by the Purchaser. 1920.

Committee: Samuel Miskelly (C., R. I. & P.), chairman; E. K. Post (P. R. R.), vice-chairman; T. S. Adams (N. Y. C.), Larsen Brown (A., T. & S. F.), W. F. Cook (D. & H.), W. A. Dawson (N. Y. C.), O. H. Eichblatt (S. P. Atl. System), Oswald Frantzen (N. Y., N. H. & H.), William Hiles (C., C. & St. L.), F. E. Jacobs (C. & W. I.), C. J. Kello-

way (A. C. L.), H. F. Lomas (I. C.), J. W. McClelland (P. & R.), E. E. Mack (C. & E. I.), W. B. Morrison (D., L. & W.), E. J. Relph (N. P.), C. Smith (C. P.), J. G. Stoll (L. V.), M. E. Sutherland (M. C.), R. W. Taylor (B. & O.), J. I. Vernon (N. Y., N. H. & H.), W. F. Zane (C., B. & Q.).

Discussion

Samuel Miskelly (chairman) presented the report of the committee and said: Since the report of the committee was submitted to the secretary for publication a number of suggestions were given to the committee and the committee has held several meetings since that time. A few corrections have been made, which we submit, and paragraph (b) under "General" has been amended by eliminating the words "unless otherwise specified" at the end of the line. We have also amended paragraph (f) under "General" by inserting after brass "85 per cent copper, 15 per cent tin," making that read "hard brass, 85 per cent copper, 15 per cent tin and steel."

The committee got hold of a dog of an old machine, which had been in service for 20 yr., and also a dog that had been produced recently, and had them analyzed by one of the large bearing concerns. They reported that the old dog was composed of 85 per cent copper and 15 per cent tin, the new dog being composed of about 80 per cent copper, 15 per cent tin and 5 per cent lead.

J. E. Stephenson (Gen. Ry. Signal Co.): I think the term "bronze" instead of brass should be used in that section.

F. P. Patenall (B. & O.): I hope the committee will not accept the suggestion.

The one thing which was not mentioned by the chairman was the analysis of the wear. I think a swing dog having been in service 20 yr. must have developed certain wear, and if it were possible it would be interesting to know what the comparison was.

Mr. Miskelly: Mr. Lomas of the committee has made such an analysis, and finds that the wear is about 0.001 of a per cent.

F. P. Patenall: Just a word on this plan of proposed machine leg for Style A machine. Will the chairman tell us whether this design is such as to admit of interchangeability with machines now in service made by either of the manufacturing companies?

Mr. Miskelly: It is interchangeable with certain legs, but only with legs of that height. Legs that are in service now are of a height less than the height of this leg. This leg is of the height of the present leg, plus one of the extensions.

The committee eliminates (i), paragraph 6, the words, "shall be in accordance with drawing No. — and," and takes out the words "tappets in" in section (n), paragraph 6, and substitutes the word "without" in place thereof.

The committee also recommends that clause (e) of paragraph 10, Tests, be eliminated.

The committee recommends that the specification for mechanical interlocking machine, Style "A" locking, be accepted for presentation at the annual meeting for submission to letter ballot for inclusion in the Manual.

(Motion, after being seconded, carried.)

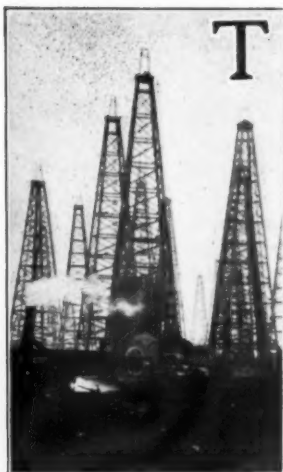
Mr. Miskelly then presented the matter under Mechanical Machine Lever Locking, 1920, and moved that the specification for Mechanical Machine Lever Locking be accepted for presentation at the annual meeting for submission to letter ballot for inclusion in the Manual.

(Motion seconded, and carried.)

The committee was dismissed with the thanks of the association.

The convention adjourned until 10 o'clock Tuesday morning.

Report of Committee XVI—Specifications for Oils



THE FOLLOWING outline of work was assigned this committee:

- (1) Outline of methods of testing.
- (2) Review specifications for illuminating oil, with the view of raising the standard requirements.
- (3) Prepare specifications for:
 - (a) Motor gasoline.
 - (b) Lubricating oil.
 - (c) Transformer oil.

The committee submitted specifications on the following subjects:

- (1) Specification for zero F. lubricating oil, No.
- (2) Specification for 45 de-

degrees below zero F. lubricating oil, No.

Specification for Zero Fahrenheit Lubricating Oil No.

PURPOSE

- (a) The purpose of this specification is to provide for a lubricating oil for signal mechanisms and crossing protection apparatus in territories where the temperature does not fall below zero degrees F. This oil shall not be used on relays or in oil dash pots. (S.S. 1-a.) 1919.

MATERIAL

- (a) Oil shall be pale in color, neutral and free from vegetable or animal oils or fats, alkali or foreign matter. 1920.
- (b) Oil shall conform to the following requirements:
 - (1) Flash. Minimum 305 degrees F. (151.7 degrees C.).
 - (2) Fire. Minimum 345 degrees F. (173.9 degrees C.).
 - (3) Viscosity. 100 sec. minimum to 135 sec. maximum at 100 degrees F. (37.8 degrees C.) on the universal Saybolt viscosimeter.
 - (4) Cold. Pour 0 degrees F. (17.8 degrees C.).
 - (5) Moisture. None.
 - (6) Sulphur. Free sulphur—none.
 - (7) Acid. Not more than .03 per cent, calculated as SO₂.
3. Inspection, and 4. Tests are standard sections, except 4-(d) and (e).
- (d) Sample for test shall be taken from the bottom of the oil through an opening in the container or by use of a thief. 1920.
- * (e) Tests shall be made in accordance with the following methods:

FLASH TEST

- (a) The flash test shall be made in the Cleveland open cup, consisting of two parts, one the cup, the other a brass metal plate 5 in. in diameter by $\frac{1}{4}$ in. thick, slightly recessed in its upper face to receive the base of the cup. The metal plate and oil holder are usually mounted on a tripod to which a wire is attached for supporting the thermometer. The latter may be supported by a clamp on a ring stand or by a chain. The thermometer used shall be of the engraved chemical stem "bulb immersion" type, corrected for 1 in. immersion and reading to approximately 700 degrees F. (371 degrees C.). The bulb shall be about three-eighths inch long, not exceeding $\frac{1}{2}$ in. The thermometer shall be suspended in the center of the cup, and free from the bottom by $\frac{1}{8}$ in. Fill cup to within $\frac{1}{2}$ in. from the top. Avoid overheating locally by wiping the flange free of oil and not allowing oil to be spattered up the sides of the cup. 1920.
- (b) The oil shall be heated at a uniform rate of 10 degrees F. (5.6 degrees C.) per min. and at approximately 25 degrees F. (14 degrees C.) below the expected flash, the test shall be applied at every rise of 5 degrees F. (2.8 degrees C.) by resting the gas tube on the edge of the cup and searching for the flash in the semicircle around the thermometer, mid-

way between it and the inside of the cup, carrying the flame level with the top of the cup. The temperature at which flashes occur on the surface of the oil at two points or one that covers at least half of the surface and immediately goes out shall be recorded as the flash test. 1920.

- (c) The testing flame is provided by using a slender tube tapered at one end to an opening approximately $\frac{1}{8}$ in. diameter. The flame should be in the form of a bead and not more than $\frac{1}{8}$ in. diameter. 1920.

FIRE TEST

- (a) The fire test shall be made by continuing the flash test, the operation being the same except in the application of the test flame. The flame in the fire test shall be quickly brought to $\frac{1}{8}$ in. above the surface of the oil near the center of the cup and as quickly removed. The fire test is usually from 40 degrees F. (4.4 degrees C.) to 80 degrees F. (27 degrees C.) higher than the flash test, the temperature to which the oil must be heated to cause it to give off gases which will burn continuously when a flame is applied above the surface of the oil, shall be the fire test. 1920.

VISCOSITY TEST

- (a) The viscosity test shall be made by using the Saybolt universal viscosimeter. The oil tube shall be swabbed with the plunger accompanying the instrument by using oil from sample, making sure the outflow tube is not obstructed. Strain the oil into the oil tube at a temperature not above that of the bath, stir until the oil is of the test temperature throughout, remove the thermometer, remove excess oil from the overflow chamber with the pipette and proceed with the test. The elapsed time in seconds required for the oil to fill the flask to the 60 cu. cm. mark on the neck shall be the viscosity of the oil. 1920.

COLD TEST

- (a) The cold test shall be made by using a glass jar approximately $1\frac{1}{4}$ in. in diameter and 4 to 5 in. high, provided with a tightly fitting cork. The glass jar shall be incased in a closely fitting metal jacket, which shall be provided at the bottom with a disk of cork or felt $\frac{1}{4}$ in. thick. 1920.
- (b) A bulb immersion type mercury thermometer having a bulb $\frac{1}{4}$ in. to $\frac{3}{8}$ in. long shall be fitted securely in the cork so that the shaft will be held centrally in the jar with the tip of the bulb $\frac{1}{2}$ in. from the bottom. A Toluol thermometer shall be used for temperatures lower than -20 degrees F. (-20.9 degrees C.).
- (c-1) Material used in the freezing mixture varies with the temperature required to cause the oil to solidify. Use cracked ice for a temperature above 35 degrees F. (1.7 degrees C.). From 15 degrees F. (-9.4 degrees C.) to minus 5 degrees F. (-20.6 degrees C.) use ice and salt in proportion of one to two. The salt shall be dry and fine enough to pass through a 20 mesh screen. For temperature lower than minus 5 degrees F. (-20.6 degrees C.) use a mixture of solid carbon dioxide and acetone.
- (c-2) The carbon dioxide-acetone mixture may be made as follows:

Place a sufficient amount of dry acetone in a covered copper or nickel beaker. Place the beaker in an ice-salt mixture and when the acetone reaches 10 degrees F. or less, add solid carbon dioxide gently until the desired temperature is reached. To obtain the solid carbon dioxide, invert an ordinary liquefied carbon dioxide cylinder, open the valve carefully and let the gas flow into a chamois skin bag. Rapid evaporation will cause the carbon dioxide to solidify. 1920.

- (d) The oil shall be placed in a jar, to a depth of about one and one-fourth inch, or to a sufficient depth to reach about one-fourth inch above bulb of thermometer. Fit the cork tightly into the jar, put the thermometer in cork, making sure that bottom of bulb is about one-half inch from the bottom of the jar. Place jar in metal jacket and place jacket in freezing mixture. 1920.

(e) Pour. When near the expected pour point, at every drop in temperature of five degrees F., remove the jar from the jacket and chill just enough to make it flow, and five per cent higher than the temperature of the oil which has been cooled so that it will not flow when the jar is tipped to a horizontal position, shall be the pour test. 1920.

MOISTURE TEST

- (a) The moisture test shall be made by taking a sample from the bottom of the container, which, when placed in

*Tests are based on A. S. T. M. standard methods (D-47-18).

clean and dry glass or porcelain beaker and stirred without touching the sides or bottom with $\frac{1}{4}$ -in. brass or iron rod heated to a cherry red, shall not cause a snapping sound.

1920.

ACID TEST

(a) The acid test shall be made by agitating thoroughly a solution at a boiling point of 5 grams of the oil with 25 cu. cm. of distilled water and 25 cu. cm. of 95 per cent neutralized alcohol. A few drops of phenolphthalein shall be added as an indicator and the result, if colorless (indicating acid present) shall be titrated with 1/10 normal alkali, free from carbonate until permanently pink when agitated. The percentage of acid shall be calculated from reading the burette and shown in percentage of SO^2 or as an acid number (milligrams of potassium hydroxide required to saturate the free acid in one gram of oil). 1 cu. cm. of 1/10 alkali 4 m.g. SO^2 .

1920.

(b) A strip of planished copper shall not tarnish when placed in a sample of oil at 212 degrees F. (100 degrees C.) for 8 hrs.

1920.

MARKING

(b) Detail list of loose pieces, containers and their contents shall be furnished for each shipment. Where carload shipments are made, routing and car identification shall be shown. (S.S. 9-b.) 1919.

(d) Each quart container shall be marked with label as follows:

Zero Lubricating Oil A. R. A. Specification No.

This oil must not be used for lubricating signal mechanisms or crossing protection apparatus in territories where temperature falls below zero degrees F. This oil must not be used on relays or in oil dash pots.

Furnished by

1920.

(e) Purchaser's order, requisition and A.R.A. oil specification number, name of consignor and name and address of consignee shall be plainly marked on outside of each case or drum.

1920.

(f) Where carload shipments are made, each case or drum shall be marked with contents, order number and address may be omitted.

1920.

PACKING

(b) The oil shall be put up in clean, dry containers of one quart size, provided with a screw top and air-tight gasket, or in steel drums of approximately 50-gal. capacity and shall be protected so as to permit convenient handling and to prevent loss or damage during shipment.

1920.

The committee recommended that specification for zero Fahrenheit lubricating oil, No., be accepted for presentation at the annual meeting for submission to letter ballot for inclusion in the Manual.

Specification for Forty-five Degrees Below Zero Fahrenheit Lubricating Oil No.

PURPOSE

(a) The purpose of this specification is to provide for a lubricating oil for signal mechanisms. This oil shall not be used in oil dash pots. (S.S. 1-a.) 1919.

MATERIAL

(a) The oil shall be pale in color, neutral and free from vegetable or animal oils or fats, alkali or foreign matter.

1920.

(b) The oil shall conform to the following requirements:

1. Flash. Minimum 290 degrees F. (143.3 degrees C.).
2. Fire. Minimum 325 degrees F. (162.8 degrees C.).
3. Viscosity. Minimum 80 sec. at 100 degrees F. (37.8 degrees C.) on the universal Salbolt viscosimeter.
4. Cold. Pour at -45 degrees F. (-42.8 degrees C.).
5. Moisture. None.
6. Sulphur. Free sulphur—None.
7. Acid. Not more than .03 per cent calculated as SO^2 .

1920.

3. Inspection and 4. Tests are standard sections, except 4(d) and (e), which are the same as "Specification for Zero Fahrenheit Oil No."

This specification covers the same method of conducting (1) the flash test, (2) the fire test, (3) the viscosity test, (4) the cold test, (5) the moisture test and (6) the acid test, as included in the "Specification for Zero Fahrenheit Oil No."

MARKING

(b) Detail list of loose pieces, containers and their contents shall be furnished for each shipment. Where carload

shipments are made, routing and car identification shall be shown. (S.S. 9-b.) 1919.

(d) Each quart container shall be marked with label as follows:

Forty-five Degrees Below Zero Lubricating Oil.**A. R. A. Specification No.**

This oil must not be used in oil dash pots.

Furnished by

1920.

The paragraphs (e) and (f) under 5. **Marking**, and paragraph (b) under 6. **Packing**, are the same as "Specification for Zero Fahrenheit Oil No."

The committee recommended that specification for 45 degrees below zero Fahrenheit lubricating oil, No., be accepted for presentation at the annual meeting for submission to letter ballot for inclusion in the Manual.

Committee: I. S. Raymer (P. & L. E.), chairman; C. H. Burnette (Monongahela), C. F. Jones (Sou. Lines West), L. E. Kinch (P. R. R.), S. W. Law (N. P.), E. B. Fry (P. R. R.), D. S. Rice (L. V.), B. H. Richards, E. B. Smith (N. Y. C.), W. S. Storm (Erie), Guy Toft (P. R. R.).

Discussion

I. S. Raymer (chairman) presented the report.

G. R. Stephenson: In connection with the specification for Zero Fahrenheit Lubricating Oil, I would ask if this oil is easily obtainable, and whether it has been definitely determined that an oil somewhat lower in flash and fire point, and somewhat lower in viscosity, would not meet all the requirements to which this oil is to be put?

I. S. Raymer (P. & L. E.): The oil can be procured from practically every refinery in the United States. The matter of procuring an oil with a lower viscosity is merely a question as to whether you want to give up some of the lubricating qualities in the oil for something else that you may desire. Personally I think the viscosity should not be sacrificed.

Mr. Stephenson: It is a question in my mind if it would be sacrificed if it was a trifle lower than shown.

F. B. Wiegand (N. Y. C.): In reading over the specification it occurred to me that we had gone into too much detail in the flash test and in the fire test. With that in mind I wrote to our Assistant Engineer of Tests, asking his opinion. He says on account of the simplicity of the Cleveland open cup tester, the Cleveland open cup is specified in the majority of oil specifications, and is a part of the equipment in every well-equipped laboratory where oils are tested. He makes the following suggestion with reference to the flash test:

"Flashing point will be determined in a Cleveland open tester. The oil will be heated quickly to a point 100 deg. below the expected flash point. The heating will then be continued at 10 deg. per min. At every fifth degree a test flame, not over $\frac{1}{8}$ in. long, will be passed over the oil for two seconds on a plane halfway between the surface of the oil and the top of the cup. When the flashing point is reached the oil shall be $\frac{1}{4}$ in. to $\frac{3}{8}$ in. below the top of the cup."

With reference to the fire test, he suggests: "After the flash point is obtained, the oil shall be heated at the same rate (10 deg. per min.) test flame applied every fifth degree, after the flash point has been obtained." The flash and fire tests are made daily in all laboratories testing oils, and are a mere matter of routine.

I would like the committee to consider this matter, and determine if we could not eliminate some of the details in the proposed specification, stating just how the matter should be handled.

Mr. Raymer: The committee has made an endeavor to get away from the personal factor as far as possible. It is desirable that the test shall be made by a man who has not seen it made before.

P. H. Conradson (Galena Signal Oil Co.): As regards the flash point part of the specification, the Cleveland open cup is generally used by the manufacturers and oil dealers. However, of late years, the sand bath has been taken away and in many refineries and laboratories they are simply applying the flame direct under the bottom of the cup, or else having a steel plate about $\frac{1}{4}$ in. or $\frac{1}{8}$ in. thick between the flame and the bottom of the cup.

There should be some modifications in regard to the proposed specifications in taking the flash point. In the first place, you are using only $\frac{1}{8}$ in. from the end of the thermometer bulb to the inside diameter of the cup. That should be $\frac{3}{8}$ in. Then the specifications propose that the cup shall be filled to $\frac{1}{4}$ in. from the top of the cup. If you have an oil that flashes at 300 deg. the effect of the explosion on the oil will be such that it will overflow. Therefore that distance should be modified to $\frac{3}{8}$ in. or more.

As regards applying the test flame, you say put the flame across the top near the surface. That should be provided for more definitely. If you apply it at $\frac{1}{8}$ in. you are apt to get a flash you really should not have, on account of the heat from the test flame.

I think perhaps the committee might consider using the Cleveland cup with sand bath or without sand bath, because the Committee on Lubricants of the American Society for Testing Materials will hold a meeting the latter part of this month, at which specifications for flash test will be adopted, and presented to the society next July, and it would be a useful thing if our committee could express itself in that connection.

I think it would be a good idea to describe the flame tube a little different from what is done here. If you let the oil get too close to the top of the cup you get very indifferent results. If the oil has a high flashing point of 300 or 350 deg., that is too close to the flame.

Mr. Raymer: I move that the specifications for Zero Fahrenheit Lubricating Oil be accepted for presentation at the annual meeting for submission for letter ballot for inclusion in the Manual.

Mr. Raymer then presented the specification for 45 deg. below zero Fahrenheit lubricating oil.

(Motion carried.)

The committee was dismissed with the thanks of the association.

Frank McManamy on Shopmen's Agreement

A lively meeting was held by the Western Railway Club at the Hotel Sherman, Chicago, on Monday evening. Frank McManamy, former assistant director, Division of Operation, United States Railroad Administration, and now manager of the Department of Equipment, Division of Liquidation Claims of the Railroad Administration, spoke on the national agreement with shopmen. He outlined fully the way in which this agreement had been reached and its application, speaking, of course, from the standpoint of the Railroad Administration. Naturally his address was followed with a spirited discussion of the various details of the application of the terms of the agreement.

Restaurant Facilities in Coliseum

The National Railway Appliances Association has arranged for the operation under its direction of the restaurant in the basement of the Coliseum for the convenience of exhibitors and others. It offers both lunch-counter and dining room facilities. The officers of the association assure that the food is of the best and urge patronage for it.

Signal Division Registration

THE REGISTRATION AT THE meeting of the Signal division of the American Railroad Association yesterday totaled 248 active and 98 affiliate members, a total of 346. This is 28 in excess of registration of last year and compared with 198 for 1918.

Active Members

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 Gault, Paul M., Asst. Engr., Sig. Dept., Ill. Cent. R. R., Chicago, Ill.
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 Hill, A. C., Sig. Supr., B. & A. R. R., Springfield, Mass.
 Himes, A. B., Asst. Engr. Sigs., B. & O. R. R., Western Lines, Cincinnati, Ohio.
 Hinton, K. A., Sig. Supr., C. I. & W. R. R., Indianapolis, Ind.
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 Hodgdon, C. R., Sig. Engr., Can. Pac. Ry., Winnipeg, Man.
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 Kelloway, C. J., Chairman, Supt. of Signals, Atlantic Coast Line, Wilmington, N. C.
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 Richards, D. W., Sig. Engr., N. & W. Ry., Roanoke, Va.
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- Starkweather, Frank E., Asst. Sig. Engr., Pere Marquette R. R., Detroit, Mich.
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 Stradling, E. G., Sig. Engr., C. I. & L. R. R.
 Stuart, F. C., Sig. Engr., E. J. & E.
 Stump, Harry N., Supr. Sigs., P. R. R., Jersey City, N. J.
 Sutherland, M., Sig. Engr., Maine Central R. R., Brunswick, Me.
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 Thomas, Geo. K., Asst. Sig. Engr., A. T. & S. F. Ry., Topeka, Kan.
 Thompson, S. R., Sig. Supr., C. & O. Ry., Huntington, W. Va.
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 Turner, Robt., S., Sig. Supr., U. P. R. R., Evanston, Wyo.
 Uhr, I. A., Sig. Engr. St. L. & S. F. R. R., Springfield, Mo.
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 Whitcomb, L. L., Supr. Sigs., N. Y. C. R. R., West of Buffalo, Elyria, Ohio.
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Supply

- Bunn, J. W., Galena Signal Oil Co.
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 Hough, S. J., Waterbury Battery Co., N. Y.
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Annual Exhibit of the N. R. A. A. at the Coliseum

Large Number of New Exhibitors and New Decorative Scheme Feature This Year's Show

WITHOUT OSTENTATION THE RAILROADS of the United States were returned to their owners on March 1. Up to the present time there has been little opportunity for the manufacturers and distributors of appliances used in steam and electric railway operation, maintenance and construction to do other than to follow railroad reorganizations during this transition period and to quietly heave a sigh of relief. It has remained therefore for the National Railway Appliances Association to appropriately commemorate the beginning of a new era in railroad history. Partly because of optimism and partly because of the energetic efforts of C. W. Kelley, secretary, and the officers of the Association, the annual exhibition at the Coliseum which opened yesterday morning at 8:00 a. m. has been heralded as and is the "biggest ever."

In the light of these developments it was deemed advisable to decorate the interior of the Coliseum in a more elaborate manner than has been the practice heretofore. The new decorative scheme is featured by the arrangement of a false ceiling composed of three festoons of alternate apple green and white. This ceiling will form a canopy for the entire exhibiting space. Against it will be silhouetted the old-bronze partitions and signs, making an exceptionally pleasing and effective arrangement. Added to this effect will be a uniformity in the style, color and type of furniture and other decorative features placed in the respective booths of the exhibitors. This uniformity has been brought about through the handling by the Association of all furniture, electrical fixtures and decorative effects instead of allowing this work to be handled by outside agencies as has been done in the past.

There were 1,152 members of the National Railway Appliances Association who enrolled yesterday, while the total attendance up to 5 o'clock last night was 1,953.

In arranging the floor plan of the Coliseum for the

present exhibition the officers of the Association were confronted with the problem of allotting space to 32 new exhibitors in addition to those who have been exhibiting in the past. The problem was made still more difficult by the fact that the regular exhibitors were asking for 20 per cent more space than was available. The problem was successfully solved by assigning the usual amount of space to all of the old exhibitors and subsequently curtailing the amount of space allotted in several cases.

The practice adopted several years ago of having the main entrance to the show through the Annex, which in turn is an integral part of the exhibit, has been continued this year. In general the floor plan of the Coliseum is substantially the same as in previous years, with many firms occupying practically the same space as last year.

The exhibits themselves have been arranged throughout with a view of presenting to the railroad men the salient points of each product with emphasis upon the educational rather than upon the showy.

Contrary to the usual custom, the Coliseum is to be opened each day this year at 8:00 a. m. and closed at 6:30 p. m., except on the second day of the convention, Tuesday, March 16, when the exhibition will close at 11:00 p. m. This arrangement has been made, according to Secretary Kelly, in order to give both the men who will be connected with the exhibits and the visitors an opportunity to get together and renew old friendships.

Approximately 10,600 tickets have been sent to railroad men, members of engineering societies, to colleges, and to members of the N. R. A. A. The plan of distribution is substantially that which was followed last year and which is intended to confine the attendance to those who are really interested in the exhibits or who are in any way connected with the railway or railway supply business.



J. B. Strong
G. C. Isbester

M. J. Trees
P. C. Jacobs

C. W. Kelly
E. E. Hudson

E. A. Johnson

L. W. Shugg

T. W. Aishton

A. A. Taylor

Officers and Directors of the National Railway Appliances Association

The officers and members of the board of directors of the National Railway Appliances Association for the past year were: President, P. C. Jacobs, H. W. Johns-Manville Company, Chicago; vice-president, J. B. Strong, Ramapo Iron Works, Hillburn, N. Y.; secretary-treasurer, C. W. Kelly, Kelly-Derby Company, Chicago; honorary director, M. J. Trees, Chicago Bridge & Iron Works, Chicago. Directors, E. E. Hudson, Waterbury Battery Company, New York; L. W. Shugg, General Electrical Company, Schenectady, N. Y.; A. A. Taylor, Fairbanks, Morse Company, Chicago; T. W. Aishton, National Malleable Castings Company, Chicago; G. C. Ibester, American Chain Company, Chicago, and E. A. Johnson, Duff Manufacturing Company, Pittsburgh, Pa.

Mr. Taylor was elected at the November meeting of the Association to succeed A. P. Van Schaick, now associated with the American Chain Company.

LIST OF EXHIBITORS

The following is a list of firms presenting exhibits, with the devices on display and the names of the representatives present at their booths:

A.G.A. Railway Light & Signal Company, Elizabeth, N. J.—Railway grade crossing signal; highway danger signal; color light signal; cutting and welding torches. Represented by J. K. Howard, E. R. Boots, A. G. Straetz, A. G. Shaver and H. S. Goldman. Spaces 39 and 40.

The Adams & Westlake Company, Chicago.—Signal lamps; lanterns; long-time burners; switch locks. Represented by Chas. B. Carson, H. G. Turner, A. S. Anderson, W. J. Piersen, J. F. Stender, F. W. Foehringer and G. L. Walters. Spaces 87, 88, 106, 107.

Adams Motor & Manufacturing Company, Chicago.—Railway gasoline-operated motor cars. Represented by W. E. Adams, R. A. Harris, A. P. Grenier and L. Gerhardt. Spaces 218 and 218½.

Air Reduction Sales Company, New York City.—Generator; oxygen and acetylene cylinders; welding and cutting apparatus. Represented by E. L. Mills, H. H. Melville, R. T. Peabody and G. E. Phelps. Spaces 167½ and 168.

Alexander Milburn Company, Baltimore, Md.—Portable carbide lights and oxy-acetylene welding and cutting equipment; acetylene generators; accessories. Represented by David Bartlett, W. J. Foster and P. J. Dalie. Spaces 165 and 166.

Alexander Railroad Crossing & Equipment Company, Chicago.—Continuous rail crossing. Represented by Jake L. Eggleston. Space 171½.

American Abrasive Metals Company, New York City.—Feralun and Vulcalun anti-slip materials for walkway surfaces. Represented by C. A. Barker, H. W. Mowery and L. A. Hale. Space 167.

American Chain Company, Inc., Bridgeport, Conn.—Chain products. Represented by W. T. Morris, W. M. Taussig, G. C. Ibester, A. P. Van Schaick, J. E. Pumphrey, J. W. Cole, R. B. Stauffer, W. D. Kirkpatrick, T. A. Cotter, W. R. Dawson and E. O. Johnstone. Space 70.

American Hoist & Derrick Company, St. Paul, Minn.—Railroad ditcher. Represented by F. J. Johnson, J. L. Hickey, W. L. Manson, Edward Coleman and W. B. Maurer. Space 88½.

American Kron Scale Company, New York City.—Express type, springless-dial scale; 1 c. l. freight scale. Represented by E. Ohnell, W. W. Camp, J. Kirk Rowell, E. M. Abramson, E. M. Franklin and C. F. Larson. Space 125.

American Malleable Castings Association, McKees Rocks, Pa.—Malleable iron castings. Represented by A. O. Buckins, A. M. Fulton, V. H. Meissner and Scott MacKay. Spaces 221, 222 and 223.

American Rail Joint Company, New York City.—Wedge joints; Peerless and Champion steel ties; Goddin rail joints. Represented by J. A. Hyle and H. T. Goddin. Space 161½.

American Railway Bridges and Building Association, Chicago. Spaces 226-227.

American Railway Signal Association, Chicago.—Spaces 226-227. American Spike Company, New York City.—Sessler grip-spikes; tie exhibits showing wood structure. Represented by Geo. D. MacKay, Jr., S. M. Strasburger, E. M. Davidson and Marcel K. Sessler. Space 6.

American Steel and Wire Company, New York City.—Railroad fence; steel fence posts; fence gates; electrical wires and cables; wire rope; rail bonds; signal wire. Represented by J. W. Meaker, Jr., L. P. Shanahan, J. W. Collins, J. F. Alexander, A. W.

Evans, W. Mackley, C. S. Knight, Jr., C. F. Wiley, B. H. Ryder and W. F. Pfundt. Spaces 51½, 52, 70½ and 71.

American Valve & Meter Company, Cincinnati, Ohio.—Automatic water columns; telescopic spouts; automatic float valves and tank fixtures; yardmaster switch stands; switch stands; interlocking switch stands; safety switch locks. Represented by J. T. McGarry, D. J. Higgins, F. C. Anderson. Spaces 130, 131 and 132.

American Vulcanized Fibre Company, Pittsburgh, Pa.—Fibre for rail joint, steel tie insulation, mechanical and electrical uses. Represented by C. W. Sutton, C. C. Bell, H. C. Hackett, Wm. Maxwell and John Barron. Space 126.

Anchor Company, New York City.—Rail anchors. Represented by Geo. H. Chadwell and Orlando Metcalf. Space 192½.

Armco Iron Culvert & Flume Manufacturers' Association, Middletown, Ohio.—Split ingots of steel and iron showing the low gas content of the American ingot iron as compared with the steel; polished sheets for locomotive jackets; American ingot iron alloy coated sheets for passenger car and locomotive cab roofs; galvanized American ingot iron sheets for general building purposes and Armco culverts. Represented by T. W. Jenkins, J. S. Roney, Arno B. Rainke, F. B. Milhoan, D. E. Foley and Carl Schulz. Spaces 99 and 100.

Austin Company, Cleveland, Ohio.—Layout, engineering construction and equipment service. Represented by G. A. Bryant, G. E. Lemmerich, C. F. Chard, W. L. Bailey, A. S. Low, R. F. Bell, L. O. Stocker, W. J. Austin and E. M. Haas. Spaces 158 and 158½.

Balkwill Manganese Crossing Company, Cleveland, Ohio.—Articulated cast manganese railway crossing. Represented by S. Balkwill. Space 115.

Barrett Company, New York City.—Barrett specification roofing; waterproofing; flooring; roof connections; boiler covering compound; slate surface roofing and shingles and prepared roofing. Represented by G. R. McVay, O. R. Aleshire, W. T. Kelley, C. H. Walsh, Geo. L. Wilson, J. De Berg, F. W. Freeman, K. C. Barth, Walter Buchler, W. S. Babcock and J. J. Ross. Spaces 107½ and 108.

Bay City Foundry & Machine Company, Bay City, Mich.—Automatic hoist; shallow pit bucket; car puller. Represented by L. G. Howlett, W. E. Howlett and C. B. Curtiss. Space 3.

Benjamin Electric Manufacturing Company, Chicago.—Industrial lighting equipment; railway crossing fixtures; angle reflectors and roundhouse fixtures; water-tight electrical devices and lighting fixtures; electric signals; panel boards. Represented by Mr. Snell. Space 334.

Bethlehem Steel Company, Bethlehem, Pa.—Parallel throw switch stand with target, mast, and lamp post; switch stands; railbound manganese frog. Represented by R. W. Gillespie, H. E. Stoll, F. A. Weymouth, N. E. Salsich, K. C. Banks, G. H. Riddle, E. S. Goodwillie, E. D. Campbell, W. W. Philler, L. F. Green, J. S. Hegeman, S. H. Smith, E. S. Illig, E. B. C. Goyné, E. H. Gumbart, J. F. Hennessy, C. A. Alden and G. S. Vickery. Spaces 199 and 216.

Blaw-Knox Company, Pittsburgh, Pa.—Clamshell buckets; buildings; garages; contractors' bunk houses; steel form for concrete construction. Represented by R. B. Randall, O. B. Pullis, R. D. Allrich, J. K. Bissell, L. R. Grannis and I. A. Pfeil. Space 136.

Boss Nut Company, Chicago.—Lock nuts. Represented by J. W. Fogg, W. C. Irwin and A. W. MacLean. Spaces 1 and 2.

Bryant Zinc Company, Chicago.—Highway crossing protection devices: Auto flags; crossing bells; rectifiers; lightning arresters; testing instruments and relays. Represented by S. C. Bryant, W. P. Graves, J. F. Gubbins, J. Hensel, A. Muller and T. H. Cole. Spaces 154-155.

Buda Company, Chicago.—Electric truck; track drill with chuck; bonding drill with clamp; car replacers; journal jack; ratchet jacks; grinders with complete attachments; switch stand; electric crossing gate post; electro pneumatic crossing gate; motor section cars; velocipede; motor velocipede; bumping post; Balkwill crossing; headlight. Represented by J. L. Artmaier, Harry P. Bayley, H. C. Beebe, Vaughn Y. Bell, Wolcott Blair, A. L. Bliss, C. N. Bradley, G. E. Bryar, C. H. Bull, E. Conant, Jno. Conant, M. A. Evans, R. B. Fisher, Sydney Francks, J. J. Gard, L. R. Griffin, Gerald Hale, H. J. Harkless, G. W. Hoover, Wm. P. Hunt, Jr., F. W. Marvel, John R. Mayeskie, H. L. Miller, F. E. Place, M. A. Ross, L. M. Viles, L. J. Wilkinson, P. W. Wood. Spaces 61, 62, 63, 64 and 65.

Buffalo Forge Company, Buffalo, N. Y.—Slitting shear, punch and bar cutter; forges; drills; blowers. Represented by H. W. Wendt, Jr., E. G. Leonard and H. O. MacDougall. Spaces 228, 229 and 230.

Cambria Steel Company, Philadelphia, Pa.—See Midvale Steel & Ordnance Company. Spaces 71½-72.

Carbic Manufacturing Company, Duluth, Minn.—Portable lights; portable acetylene generators; oxyacetylene welding and

cutting equipment. Represented by A. D. Guthrie, H. Bolinder and J. S. Strate. Space 14.

Carter Bloxonend Flooring Company, Kansas City, Mo.—Flooring for freight houses, machine shops, baggage, mail and express cars, baggage and express rooms. Represented by M. G. Truman, R. G. Stowell and Frank Bronez. Space 225.

Chicago Bridge & Iron Works, Chicago.—Railroad water tanks; railroad fuel oil tanks; elevated tanks for fire protection. Represented by M. J. Trees, K. I. Small, H. B. Murphy, H. C. Brown, C. S. Scheman, G. T. Horton, H. B. Horton, H. E. Horton, C. M. Ladd, R. Green, F. L. Cook, R. Campbell and C. D. Pillsbury. Spaces 52½ and 53.

Chicago Flag & Decorating Company, Chicago.—Railway signal flags. Represented by Geo. L. Glendon, Gus Magnussen and Thos. Glendon. Space 87.

Chicago Malleable Castings Company, West Pullman, Ill.—Rail anchor tie plates. Represented by J. S. Llewellyn, Warren Moore Osborn, Alan Rogers and G. W. Robb. Space 142.

Chicago Pneumatic Tool Company, Chicago.—Pneumatic hammers; pneumatic and electric drills and grinders; air compressors; oil and gas engines; hammer rock drills; air hose; hose couplers; accessories. Represented by W. P. Pressinger, C. W. Cross, H. G. Barbee, J. L. Canby and A. C. Andersen. Spaces 133 and 134.

Chicago Railway Signal & Supply Company, Chicago.—Railway signal relays; lightning arrester; signal forgings; rail joint

Detroit Graphite Company, Detroit, Mich.—Paint for the interior of railroad buildings and graphite paint for bridges and other metal structures; locomotive and car paints. Represented by T. R. Wyles, L. D. Mitchell, W. D. Waugh, J. J. Hogan, A. B. Edge, E. Booth, A. B. Miller and E. L. Warner. Space 108½.

Diamond State Fibre Company, Bridgeport, Pa.—Fibre insulation for insulated rail joints. Represented by Gerald Swallow. Space 13.

Paul Dickinson, Inc., Chicago.—Smoke jacks; chimneys and building ventilators. Represented by A. J. Filkins and D. B. Wright. Space 98.

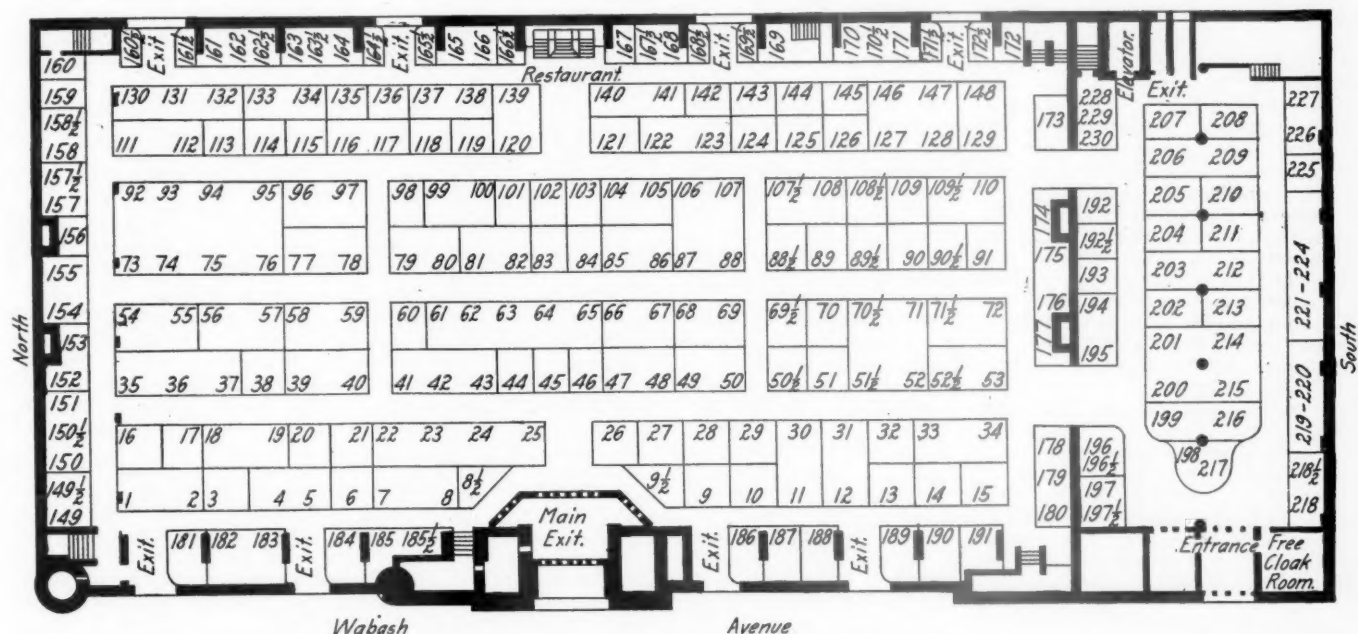
Dilworth, Porter & Co., Inc., Pittsburgh, Pa.—Spikes and tie plates. Represented by W. F. Schleiter, Joseph Dilworth and A. Morrison. Space 27.

Duff Manufacturing Company, Pittsburgh, Pa.—Track jack; high-speed ball-bearing screw jacks; car jacks; journal jacks. Represented by E. A. Johnson, C. N. Thulin, C. A. Methfessel and G. E. Anderson. Space 84.

Edison Storage Battery Company, Orange, N. J.—Alkaline storage batteries. Represented by John Kelly, W. F. Bauer and D. C. Wilson. Space 20.

Thomas A. Edison, Inc., Bloomfield, N. J.—Edison primary batteries; Edison outfits for lighting signals by electricity. Represented by L. W. McChesney, R. J. Frost, P. A. Garrity and A. J. Loughren. Space 20.

Electric Storage Battery Company, Philadelphia, Pa.—Port-



Floor Plan of the Coliseum and Annex Showing the Space Assignments

expander, etc. Represented by A. C. Danne, E. K. Brashears, D. J. McCarthy, C. R. Akrens, T. T. O'Fallow, R. F. Jehse, Wm. McClintock, W. C. Martin, A. L. Warner and E. W. Vogel. Spaces 77 and 78.

Chipman Chemical Engineering Company, Incorporated, New York City.—Atlas A method of weed killing; a miniature model train showing method of application. Represented by Ralph N. Chipman, R. B. Davis and E. D. Jackson. Space 89½.

Clark Car Company, Pittsburgh, Pa.—Extension side dump cars, air operated. Represented by H. E. Chilcoat, R. L. Mason and H. G. Doran. Space 135.

Cleveland Frog & Crossing Company, Cleveland, Ohio.—Frogs, crossings, etc. Represented by G. C. Lucas, Geo. Stanton, G. A. Peabody, L. G. Parker and J. A. Donahey. Space 90½.

Copper Clad Steel Company, Rankin, Pa.—Machine in operation drawing wire; samples of copper clad steel; samples showing the process of reducing copper clad steel to the finest wire. Represented by C. B. Semple, Marshall Page, R. A. Paterson and Geo. T. Bain. Space 213.

Crerar, Adams & Company, Chicago.—Track drills; bonding drills; jacks of different kinds; tool grinders; oil cans; journal jacks; self lowering jacks. Represented by R. Wallace, W. I. Clock, G. D. Bassett, J. A. Martin, E. C. Poehler, C. W. Gregory, R. M. Bullard, C. D. Derby and E. W. Coon. Space 28.

able signal batteries; interlocking signal battery; semaphore signal operated by 5-cell battery; car lighting; alloy cover assembly; compound jar; double flange alloy cover. Represented by G. H. Atkin, J. Lester Woodbridge, T. Milton, H. B. Crantford, H. M. Beck and H. E. Hunt. Space 60.

Engineering News-Record, New York City.—Engineering News-Record. Represented by Wm. Buxman, I. S. Halbrook, F. G. Hudson, H. H. French, E. E. R. Tratman and A. E. Haberton. Space 8½.

Equipment Corporation of America.—See W. F. Hebard. Space 181.

Eymon Crossing Company, Marion, Ohio.—Continuous-rail crossing. Represented by Byron E. Wilson, J. H. Eymon and A. C. Queen. Space 169½.

Fairbanks Company, New York City.—Gas engines; electric motors; power transmission appliances; machine tools; pumps; valves; unions; trucks; baggage wagons; railroad shop supplies. Represented by N. Lansing DeLong, F. H. Kilberry, A. J. Richardson, David Hamilton, S. N. Connally, W. A. Richards, F. E. Baumann and W. J. McDowell. Spaces 137 and 138.

Fairbanks, Morse & Co., Chicago.—Oil engines; motors and generators; pumps; motor cars; scales and locomotive water cranes. Represented by E. Lang, H. E. Vogel, G. J. Akers, J. C. Ferguson, M. J. Kochendorfer, E. J. Coverdale, F. M. Gardner, F. M. Condit, A. A. Taylor, Stephen Smith, J. L. Jones, E. E. Pendray, F. P. Drinker, J. C. Flanagan, E. C. Golladay, L. H. Matthews, D. K. Lee, B. S. Spaulding, C. B.

Skelton, C. H. Wilson, J. T. Frame, G. Howard and F. J. Lee. Spaces 73, 74, 75, 76, 92, 93, 94 and 95.

Fairmont Gas Engine and Railway Motor Car Company, Fairmont, Minn.—Model motor; roadmaster's inspection car; section motor cars; power decks complete with ball-bearing motors; motor car outfits. Represented by H. E. Wade, W. F. Kasper, H. M. Starrett, H. D. Fitz and John P. Dunning. Spaces 41, 42 and 43.

Federal Signal Company, Albany, N. Y.—Electric interlocking machine; electric switch machine; alternating current signals; direct current signals; alternating current and direct current relays and indicators; interlocked circuit controller unit for attaching to mechanical machines; switch circuit controllers with and without self-centering devices. Represented by Paul Renshaw, M. R. Briney, C. N. Beckner, A. T. Carter, Carl Henze, D. R. Morris, W. H. Reichard, S. J. Turreff, F. E. Whitcome and H. E. Ware. Spaces 47 and 48.

Federal Sign System (Electric), Chicago.—Electric railway lanterns; electric sirens; removable fuses. Represented by H. W. Neal, O. S. Burke and F. T. Baird. Space 169.

Frog, Switch & Manufacturing Company, Carlisle, Pa.—Manganese insert frogs. Represented by R. S. Hays, L. E. Weidman, W. H. Dotter and W. L. Jackson. Space 190.

General Electric Company, Schenectady, N. Y.—Automatic arc welding equipment; portable arc welding set; turbo generator headlight sets; rivet heating machine; battery charging switchboard; lead burning transformer. Represented by John Roberts, H. W. Stewart, H. M. Jacobs, C. C. Bailey, B. C. Tracy, P. O. Noble, L. W. Shugg, F. P. Jones, F. L. Hughes, C. Dorticco, W. M. B. Brady, W. T. Wagner and G. R. Bunn. Spaces 35, 36 and 37.

General Railway Signal Company, Rochester, N. Y.—Signal mechanism; position light signal; switch machine; direct current and alternating current relays and indicators; universal clockwork time contractor; mechanical time lock; adjustable track impedance; transformers; circuit controllers; lightning arresters. Represented by S. M. Day, A. C. Holden, F. W. Moffett, H. W. Lucia, F. L. Dodgson, W. K. Howe, J. E. Stephenson, W. R. Young, W. S. Henry, S. G. Johnson, S. N. Wight, M. Wuerpel and L. Thomas. Spaces 49 and 50.

Gilbert & Barker Manufacturing Company, Springfield, Mass.—Gasoline and oil storage systems; self-measuring and non-measuring hand pumps and power pumps; underground tanks and first-floor outfits. Represented by J. E. Ham. Space 144.

Gosso Company, Chicago.—Beds and camp outfits. Represented by A. E. Gosso, L. Jensen and T. B. Harned, Jr. Space 188.

Gould Storage Battery Company, Chicago.—Batteries for various uses; submarine cell; turbo generator for locomotive headlight service. Represented by Geo. R. Berger, M. R. Shedd and M. E. Pipkin. Spaces 157 and 157½.

Graver Corporation, East Chicago, Ind.—Water softeners, filters and steel tanks. Represented by W. R. Toppan, John J. Felsecker. Spaces 96 and 97.

W. & L. E. Gurley, Troy, N. Y.—Engineering and surveying instruments; hydraulic engineering instruments; standard precision weights and measures. Represented by H. M. Dibert and C. H. Smart. Space 69½.

Hall Switch & Signal Company, Garwood, N. J.—Automatic electric signals; relays; switch controllers. Represented by W. J. Gillingham, H. W. Wolff, J. A. Ritter, H. L. Hollister, C. G. Harwig, O. S. Field and O. B. Frink. Spaces 85 and 86.

Hatfield Rail Joint Manufacturing Company, Macon, Ga.—Rail joints and joint and crossing fastenings. Represented by Walter T. Johnson and Roswell A. Merritt. Space 166½.

Hayes Track Appliance Company, Richmond, Ind.—Derails. Represented by S. W. Hayes, R. W. Slautterback, W. Harding Davis, F. C. Stowell, H. G. Hersh, H. D. McCafferty, H. J. Mayer, P. I. Harris, O. M. Kendall, R. H. Gausepohl and S. E. Eikenberry. Spaces 140 and 141.

Hazard Manufacturing Company, Wilkes-Barre, Pa.—Rubber insulated signal wire; cables; steel tape armored cables; wire rope. Represented by Wm. S. Hart, Harry B. Pfisterer, Geo. P. Cady, J. E. Pickering, Thos. A. Keefe, Leroy W. Allen and Carl P. Brodhun. Spaces 18 and 19.

W. F. Hebard & Co., Chicago.—Electric industrial trucks; dumping hopper bodies; freight house and shop trailer; battery charging equipment. Represented by W. F. Hebard, E. A. Thiele, E. W. Geisler, A. C. Sloss, E. M. Abramson, A. W. Evans, W. R. Englehart, J. J. Tuite, L. D. Stocking, Chas. Gordon, B. C. Hooper, E. W. Winter, M. A. Wallace, W. C. Dyer, A. R. Dyer, C. H. Conrad, H. K. Hutton, C. W. Judd, A. F. Aird, W. V. Lewis, R. H. Dempcy, E. E. Johnson, Chas. A. Dunn, C. E. Drury, A. D. Renner, C. G. Landes, S. W. R. Dally and Wm. Oliver. Spaces 181, 182 and 183.

Hubbard & Company, Pittsburgh, Pa.—Track tools and shov-

els. Represented by J. V. Smith, S. W. White, W. H. Rimmel, S. F. Rimmel and O. W. Youngquist. Space 143.

Hyatt Roller Bearing Company, New York City.—Large bearing model; sample bearings; Hyatt equipped test cars; oiling models. Represented by M. F. Lawrence. Space 118.

Imperial Belting Company, Chicago.—Conveyor and elevator belting; transmission belting. Represented by A. G. Pickett, D. L. Jennings, B. C. Hooper, E. H. Willard, E. A. Woodworth, W. G. Willcoxson and W. D. Otter. Space 189.

Ingersoll-Rand Company, New York City.—Portable pneumatic tie tamping outfits and other air appliances applicable to track work. Represented by W. H. Armstrong, Chas. Dougherty, J. N. Thorp, Jr., C. Stanley Kulp and C. W. Melcher. Spaces 206 and 209.

H. W. Johns-Manville Company, New York City.—Expander rings; air-brake cylinder packing cups; molded cup for power reverse gear; molded brake cylinder gaskets; magnesia lagging; pipe coverings; mastic flooring; asbestos shingles; built-up and ready-to-lay roofings; asbestos wood; asbestos sheet millboard; flexible pipe covering; high temperature cement; boiler wall coating; fibre conduit; insulating cements; fuses; fire extinguishers; friction tapes and splicing compounds; insulation; hair felt; brake blocks and brake band lining; steam traps; miscellaneous packing materials. Represented by J. E. Meek, G. A. Nicol, J. C. Younglove, H. Flannagan, F. W. Doty, C. D. Biggerstaff, R. A. Hamaker, W. J. Hennessy, F. J. Horne, H. L. Leach, C. E. Murphy, H. G. Newman, H. B. Sewell, J. H. Trent. Spaces 174, 175, 176 and 177.

Jones & Laughlin Steel Company, Pittsburgh, Pa.—Reception booth. Represented by R. J. Stayman, E. D. Batchelor, J. T. Reiplinger, Robert Geddes, R. M. Kilgore and M. A. Blessing. Space 51.

O. F. Jordan Company, East Chicago, Ind.—Ballast spreader and attachments. Represented by Walter J. Riley, R. E. Bressler and Joseph A. Adley. Spaces 56 and 57.

Kaustine Company, Inc., Buffalo, N. Y.—Standard toilet equipment. Space 29.

Kalamazoo Railway Supply Company, Kalamazoo, Mich.—Gas motor cars; Moore drills; Jackson electric tampers; electric rock drills; Jackson electric valve grinders. Represented by J. McKinnon, D. A. Stewart, T. E. McAllister, H. R. Miller, C. E. Jackson, N. C. Study, W. N. Sidnam, W. E. Winterle, E. L. Shepherd and T. L. Mason. Spaces 22-23-24-25.

Kelly-Derby Company, Inc., Chicago.—Kaustine waterless toilets; septic tanks; warehouse trucks. Represented by C. W. Kelly, Chas. F. Smale, Jr., O. K. Fischer, W. B. Holcomb, David Evans, R. S. Bunzey, J. H. Fotheringham and F. B. Shalters. Spaces 11, 29 and 30.

Kerite Insulated Wire & Cable Company, Inc., New York City.—Insulated wire and cable. Represented by Azel Ames, P. W. Miller, J. W. Young, J. A. Renton, B. L. Winchell, Jr., G. A. Graber, J. A. Hamilton, W. H. Fenley and C. A. Reeb. Spaces 68 and 69.

Keystone Grinder and Manufacturing Company, Pittsburgh, Pa.—Tool grinder and attachments. Represented by S. S. Newman and John Wincrantz. Space 193.

Kilbourne & Jacobs Manufacturing Company, Columbus, Ohio.—All steel, automatic, air-dump car. Represented by Jess Moss-grove and S. T. Scofield. Space 145.

Lackawanna Steel Company, Lackawanna, N. Y.—Rail joint plates; safety head angle bars; dseamed rail; hook shoulder tie plates; steel sheet piling; track bolts and nuts. Represented by G. O. Benson, F. E. Abbott, E. J. Wetter, Jay L. Hench, C. H. Hobbs, G. A. Hagar, C. M. Cuthbert, Wm. Breeden, D. S. Wright and W. M. Petrie. Spaces 33 and 34.

Lehon Company, Chicago.—Car roofing; coach roofing; built-up roofing; asphalt shingles and roll roofing. Represented by Chas. V. Eades, Tom Lehon and H. M. Vöss. Space 109.

Liberty Steel Products Company, Inc., New York City.—Lift trucks; pulsometer pumps; solid truss brakebeams; sectional steel buildings. Represented by J. M. Borrowdale, A. W. Preikschat, F. A. Mote, C. D. Flood, W. E. Fowler, Jr., W. P. Behen, T. L. Lawry, S. W. Midgley and J. W. Weinland. Spaces 201, 202, 203 and 204.

Chas. R. Long, Jr., Company, Louisville, Ky.—Paint, paint films and test panels. Represented by Chas. R. Long, Jr., Harry Vissering, Samuel W. Russell, G. S. Turner, J. M. Monroe, W. H. Heckman and F. G. Zimmerman. Space 89½.

Lundie Engineering Corporation, New York City.—Tie plates. Represented by John E. Lundie, C. Z. Moore, W. Brooke Moore and Eugene Brandeis. Space 145.

Lufkin Rule Company, New York City.—Measuring tapes and rules. Represented by G. C. McBeth, Theodore Young and Fred Hollingworth. Space 121.

Luther Grinder Manufacturing Company, Milwaukee, Wis.—Hand and foot power grinders; bonding, flat and twist drills;

sharpening attachments. Represented by K. D. Begeman. Space 208.

M. W. Supply Company, Philadelphia, Pa.—Switch heaters; rail benders; guard rail clamps and tie plate guard rail fasteners. Represented by David L. Vaughan and Chas. Z. Vaughan. Space 101.

Macomber & Whyte Rope Company, Kenosha, Wis.—Wire rope. Represented by George S. Whyte, Jessel S. Whyte, M. H. Needham, H. F. Gerling. Space 90.

McRae's Blue Book Company, Chicago.—McRae's Blue Book. Represented by Thomas H. MacRae, Leroy Rollins, Lloyd Simonson, Clyde Hill, Francis O. Rice and Jos. A. Walsh. Space 9½.

Madden Company, Chicago.—Three-men rail laying machine; derrick truck car; ballast screen; switch point straightener; blue flag derail; tie spacer; steel fence post; unloading hooks; rail brace. Spaces 194 and 195.

Magnetic Signal Company, Los Angeles, Cal.—Highway crossing signal. Represented by M. S. Morse. Space 7.

Massey Concrete Products Corporation, Chicago.—Battery box; culvert pipe; hollow concrete poles; concrete crossing planks; battery cellar. Represented by F. V. Shannon, C. E. Gilman, B. F. Landers, J. E. Moody, Paul Kircher, J. A. Higgs, Jr., C. H. Hunsaker, P. E. Longstreet, G. H. Redding, H. W. Wilder, E. C. Alexander and D. B. Hanna. Spaces 54 and 55.

Mercury Manufacturing Company, Chicago.—Storage battery industrial tractors; freight house trailers. Represented by John R. Bensley and L. R. Millar. Spaces 115 and 116.

Midvale Steel & Ordnance Company—Cambria Steel Company, Philadelphia, Pa.—New form of truck and a miscellaneous showing of hollow and solid axles, crank pins, piston rods, tie plates, steel ties and tool steels. Represented by John C. Neale, J. C. C. Holding, George E. Thackray, G. A. Richardson and Ralph V. Sage. Spaces 71½ and 72.

Miller Train Control Corporation, Danville, Ill.—Full size instrument and equipment attached to engineer's air valve, working under air pressure, also full size instrument and shoe milled out in sections. Represented by H. B. Miller, W. A. Nininger, E. Murray and W. B. Murray. Spaces 197 and 197½.

Monroe Calculating Machine Company, New York City.—Calculating machines. Represented by Henry H. Doty and R. W. Peck. Space 9.

Mudge & Company, Chicago.—Motor cars. Represented by Burton Mudge, Robert Sinclair, Karl Eklund, Sherman Amsden, Albert Force, Arthur Pearson, Clyde Benning, Jean Vanatta, Frank De Brun, Fay Posson, William Ross, Lloyd Stratton, Wallace Baker, John Mulholand, Karl Leedom, Roy Borden, Loren Buchanan, Charles Mudge, William Behlke, V. Pagett. Space 127.

National Boiler Washing Company, Chicago.—Hot water locomotive boiler washing and refilling systems. Represented by Spencer Otis, Frederick A. Gale, H. L. Hilleary, F. S. Wichman, J. S. Maurer and F. W. Gale. Space 8.

National Carbon Company, Inc., Cleveland, Ohio.—Signal cells; dry cells; carbon brushes; flash lights; carbon specialties. Represented by W. H. Arkenburgh, R. J. Cox, R. W. Erwin, D. H. Green, I. J. Kelly, C. S. Pflasterer, W. R. Pflasterer, P. G. Pendorf, A. E. Pratt, L. R. Rhoads, M. D. Rees, W. A. Sisler, J. M. Spangler, W. G. Waitte. Spaces 150, 150½ and 151.

National Indicator Company, Inc., Long Island City, N. Y.—Train indicators. Represented by M. E. Penso. Space 156.

National Lead Company, New York City.—Red and white lead in oil. Represented by F. M. Hartley, A. H. Sabin and A. L. Laraque. Space 113.

National Lock Washer Company, Newark, N. J.—Lock washers. Represented by J. Howard Horn, F. B. Archibald, A. T. Thompson and R. L. Cairncross. Space 192.

National Malleable Castings Company, Cleveland, Ohio.—Malleable iron rail braces; tie plates; rail anchors; washers and budge-pin nuts and wrecking hook. Represented by T. W. Ashton, R. T. Hatch, C. H. Krakan and L. S. Wright. Space 102.

National Surface Guard Company, Chicago.—Cattle guards; rail saws; tie tongs. Represented by C. C. Zimmerman, C. F. Hatley and F. C. Worth. Space 211.

National Water Main Cleaning Company, New York City.—Sections of incrustated water mains before cleaning. Represented by Burt B. Hodgman. Space 172.

Geo. P. Nichols & Bro., Chicago.—Electric turntable tractor; model of electric transfer table. Represented by Geo. P. Nichols and S. F. Nichols. Space 173.

North American Engine Company, Algona, Ia.—Inspection car; general duty car; cutaway engine; post hole digger. Represented by J. Edward Murphy, H. C. Adams, E. A. Adams, C. H. Cretzmeyer, C. W. Nicoulin and Geo. W. Wilson. Spaces 196 and 196½.

Ogle Construction Company, Chicago.—Models and photo-

graphs of coaling stations and coaling station machinery. Represented by R. A. Ogle, M. W. Powell, J. G. Forster and C. F. Bledsoe. Spaces 12 and 31.

The Ohio Brass Company, Mansfield, Ohio.—Gas weld rail bonds. Represented by W. P. Bovard. Space near 186 and 191.

Okonite Company, Passaic, N. J.—Insulated signal wires and cables. Represented by J. D. Underhill, J. W. Hackett, W. R. Van Steenburgh, J. L. Phillips, F. J. White, Albert McNeil, R. N. Baker and J. N. Lorenz. Space 16.

O'Malley-Beare Valve Company, Chicago.—Globe, angle and check valves; gauge cocks; blow-off cocks; Perfection boiler checks; drain cocks and special locomotive valves. Represented by Thomas O'Malley, Edward O'Malley, J. E. Brown, J. N. Gallagher and J. M. Pigott. Space 114.

Oxweld Railroad Service Company, Chicago.—Welding and cutting equipment; rail cutting device; sample welded reclaimed frogs; sample welded reclaimed switch points; sample welded reclaimed parts of switch stands. Represented by G. M. Crownover, Wm. Leighton, J. P. Furbeck, H. W. Schulze, A. N. Lucas, L. C. Ryan, W. H. Kofmehl and I. Allison. Space 10.

P. & M. Company, Chicago.—Rail anti-creeper; bond wire protectors. Represented by F. A. Poor, P. W. Moore, F. A. Preston, F. N. Baylies, D. T. Hallberg, S. M. Clancey, P. H. Hamilton, G. E. Johnson, J. E. Mahoney, John Reagan, W. H. Reaues, L. S. Walker and John Ritchie. Spaces 122 and 123.

Page Steel & Wire Company, New York City.—Line wire; bond wires; strand, fence, welding wire. Represented by W. T. Kyle, W. H. Bleeker, C. A. McCune, Chas. L. Bennett and E. J. Flood. Spaces 81 and 82.

Peyton Safety Rail Joint Company, Centralia, Ill.—Rail joint. Represented by W. Perry, C. W. Witwer, L. H. Jonas, Wm. Cox and J. H. Melteberger. Space 172½.

Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.—Steel railway water tanks. Space 83.

Pocket List of Railroad Officials, New York City.—Pocket list of railroad officials. Represented by J. Alexander Brown, Harold A. Brown, Charles L. Dinsmore. Space 26.

Positive Rail Anchor Company, Marion, Ind.—Rail anchors; switches; girder guard rail, rail braces; guard rail braces; plates; tie plates. Represented by A. H. Told, L. C. Ferguson, E. A. LeBeau and B. B. Betts. Spaces 178, 179 and 180.

Protective Signal Manufacturing Company, Denver, Colo.—Approach lighting devices; wig-wags; crossing bells; oscillators; relays; time units; annunciators; solenoid switches, etc., for railway crossing protection. Represented by W. E. Wegner and A. E. Bacon. Space 17.

Pyrene Manufacturing Company, Chicago.—Fire extinguishers; wheeled chemical engines; safety devices. Represented by Jirah D. Cole. Space 186.

Pyro-Non Paint Company, Inc., New York City.—Fire-retardant paint for warehouses, station buildings, etc. Represented by G. F. Johnston. Space 160½.

Q. and C. Company, New York City.—Rolled steel step joints; rail joints; derails; guard rail clamps; snow melter; car and engine replacers and clamps; rail benders. Represented by F. F. Kister, R. J. McComb, E. M. Smith, L. T. Burwell, J. L. Terry and E. R. Packer. Spaces 120 and 139.

Rail Joint Company, New York City.—Standard joints; step joints; insulated joints; frog and switch joints; girder joints. Represented by V. C. Armstrong, W. P. Thomson, B. Wolhaupter, E. A. Condit, Jr., J. A. Greer, McLeod Thomson, E. L. Van Dresar, F. C. Webb, Alex Chapman, R. W. Payne, E. F. Schermerhorn, W. S. Boyce, R. R. Seward, C. B. Griffin, H. C. Hickey, C. Jenkinson, G. T. Willard, J. N. Meade and G. H. Larson. Spaces 79 and 80.

Railroad Herald, Atlanta, Ga.—Copies of the Railroad Herald. Represented by E. C. Laird. Space 165½.

Railroad Supply Company, Chicago.—Tie plates; derailleurs; wig-wag signals; crossing bells; relays; lightning arresters; annunciators; relay boxes; signs; electric measuring instruments. Represented by E. H. Bell, H. M. Buck, Paul W. Kohnen, H. G. Van Nostrand, M. J. Fox, A. H. Smith, E. P. Gowing, Geo. W. Nibbe, T. W. Nicholson, Geo. J. Schmitt, Jr., and F. M. Hill. Spaces 104 and 105.

Railway Review, Chicago.—Railway publications. Represented by Willard A. Smith, Harold A. Smith, A. E. Hooven, Chas. L. Bates, L. H. Lozier and J. T. Forbes. Space 44.

Ramapo Iron Works, Hillburn, N. Y.—Complete manganese reinforced switch with double locking switch stand; automatic safety switch stands; guard rail clamps; adjustable guard rail tie plate clamp; double shoulder solid bottom switch riser plates; adjustable rail brace. Represented by Thomas E. Akers, J. Edgar Davidson, R. J. Davidson, Jr., W. C. Kidd, William Wait Snow and James B. Strong. Spaces 109½ and 110.

Reade Manufacturing Company, Hoboken, N. J.—Herbicides and equipment for their application. An auxiliary exhibit in the form of a moving picture showing at The Play House, 1410

Michigan Boul. Represented by R. A. Bogle and A. W. Barnard. Space 191.

Reading Specialties Company, Reading Pa.—Car replacer; guard rail clamp; rail benders; compromise or step joint. Represented by J. Turner Moore, M. G. Moore, J. J. O'Connell and W. J. Zimmerman. Space 91.

Revert Sectional Tie Company, Reno, Nev.—Model and blue prints of a sectional tie. Represented by C. F. Stevens. Space between 186 and 191.

Richards-Wilcox Manufacturing Company, Aurora, Ill.—Engine house door; freight house door; lift doors, etc. Represented by A. J. Eggleston, J. H. Wise and T. G. Perry. Spaces 170, 170½ and 171.

Roadmasters and Maintenance of Way Association, Sterling, Ill. Spaces 222-227.

Roberts & Schaefer Company, Chicago.—Locomotive coaling plants; gravity sand plants; railroad cinder handling plants. Represented by Clyde P. Ross, Edward E. Barrett, H. S. Shimizu and John J. Roberts. Space 89.

Safe Lock Switch Machine Company, Lexington, Ky.—Switch machine. Represented by C. F. Jones, D. M. Case and A. W. Wilson. Space 168½.

Sellers Manufacturing Company, Chicago.—Wrought iron tie plates. Represented by J. M. Sellers, R. A. Van Houten, G. M. Hogan, T. D. Crowley and R. J. Platt. Space 124.

Signal Accessories Company, New York City.—Signal material. Represented by F. C. Lavarack, O. S. Flath and J. R. Creegan. Space 119.

Simmons-Boardman Publishing Company, New York City.—Railway publications, Railway Age, Railway Maintenance Engineer, Railway Signal Engineer, Railway Mechanical Engineer, Railway Electrical Engineer, Car Builders' Dictionary, Locomotive Dictionary. Represented by R. V. Wright, E. T. Howson, J. G. Little, F. W. Lane, T. E. Crossman, W. S. Lacher, C. B. Peck, K. E. Kellenberger, C. H. Parkes, E. R. Lewis, L. B. Sherman, F. H. Thompson, C. R. Mills, R. H. Smith, H. H. Marsh, F. S. Dinsmore, F. C. Koch, M. Moore, H. H. Skewes, L. R. Wolff, E. A. Lundy, B. J. Wilson, J. C. Marsh, C. H. Gabriel, Jr., B. W. Meisel, W. F. Rench, J. M. Rutherford and A. E. Aveyard. Space 46.

T. W. Snow Construction Company, Chicago.—Water and oil cranes. Represented by T. W. Snow and Barton Snow. Space 50½.

Southern Pine Association, New Orleans, La.—Southern pine trusses; southern pine creosoted tank; lumber density charts; slide machine; Southern pine literature. Represented by T. P. Johnston. Space 204.

Southern Railway Supply & Equipment Company, St. Louis, Mo.—Car stopper. Represented by Laurance Boswell. Spaces 161, 162 and 162½.

Squire-Cogswell Company, Chicago.—Non-freezing hydrants for coach yards, cinder pits, stock yards and station grounds; freight house fire hydrants; kerosene track thawing outfits. Represented by W. S. Squire and C. P. Cogswell. Space 159.

Standard Asphalt and Refining Company, Chicago.—Mineral rubber asphalts; mineral rubber floors. Represented by R. F. Trumbull, Chas. Muller, E. L. Hedrick, E. K. Carter, C. L. Gauthier, E. P. Shipley, G. A. Thornton, H. C. Riehle and E. W. Krueger. Spaces 163, 163½ and 164.

Steel Sales Corporation, Chicago.—Copper clad steel wire; monel metal. Represented by C. B. Semple, W. S. Krenz, H. B. Dickinson and W. J. Kirk. Space 202.

Sullivan Machinery Company, Chicago.—Air lift pumps and booster; air compressors; hammer drill; angle compound compressor. Represented by Jos. H. Brown, John Oliphant, R. E. C. Martin and J. A. Pikulski. Spaces 203 and 213.

Templeton, Kenly & Company, Inc., Chicago.—Square and round socket track jacks; square and round socket car jacks; locomotive jacks; emergency and pole pulling jacks; industrial and general service jacks. Represented by W. B. Templeton, H. B. Burlew and R. S. McLeod. Space 32.

Thompson Signal Company, Los Angeles, Cal.—Automatic flagman. Represented by A. F. Hannaford and E. J. Pace. Space 184.

Toledo Scale Company, Toledo, Ohio.—Automatic scales. Represented by H. O. Hem, C. H. Hapgood and F. V. Waltz. Spaces 4 and 5.

Track Specialties Company, New York City.—Guard rail clamp; anchor plate; compromise rail joint guard rail brace; derailler; rail joint; rail bender; tie plates; rail braces. Represented by W. B. Lee. Space 205.

Train Control Appliance Company, El Paso, Tex.—Train control machine. Represented by M. B. Bulla. Space 164½.

Torchweld Equipment Company, Chicago.—Oxy-acetylene welding and cutting apparatus. Represented by C. J. Nyquist and W. A. Slack. Space 149.

Union Switch and Signal Company, Swissvale, Pa.—Switch

valve and circuit controller, with motion plate; semaphore and light signals; relays; switch circuit controller; crossing bell; clockwork time release; resistor; switch and lock movement. Represented by W. P. Allen, C. R. Beall, G. A. Blackmore, W. H. Cadwallader, R. Clayburn, J. P. Coleman, J. J. Cozzens, Aaron Dean, S. E. Gillespie, H. W. Griffin, J. S. Hobson, L. F. Howard, A. L. Humphrey, J. L. Loucks, Geo. Marloff, H. McCready, W. P. Neubert, J. D. Roett, J. E. Saunders, H. R. Sheene, C. S. Snively, V. K. Spicer and W. W. Talbert. Spaces 66 and 67.

U. S. Wind Engine & Pump Company, Batavia, Ill.—Water columns and accessories; water supply devices; valves; model of railroad water tank; steel sub-structure, and tank spout, valve and fixtures; switch stands and switch-stand semaphores; double acting railway pumps. Represented by L. E. Wolcott, C. E. Ward, J. P. Prindle, E. B. LaSalle and F. E. Pearson. Spaces 111 and 112.

U. S. Light & Heat Corporation, Niagara Falls, N. Y.—Electric arc welders; portable, stationary and gas-driven car-lighting equipment; signal batteries. Represented by H. A. Mathews, Ed C. Wilson and H. A. Morrison. Spaces 185 and 185½.

Verona Tool Works, Chicago.—Track tools; nut locks; rail joint springs and bonding strips; portable milling machine. Represented by H. S. Paul, E. Woodings, H. C. Mull, E. L. Ruby, W. B. Lewis and A. T. Palmer. Spaces 129 and 148.

Volkhardt Company, Inc., Stapleton, N. Y.—Water hydrants. Represented by Wm. Volkhardt. Space 160.

Walls Frogless Switch & Manufacturing Company, Kansas City, Mo.—Continuous rail frog. Represented by C. E. Ennis, G. W. Humphrey and O. Leamon. Spaces 219, 219½ and 220.

Waterbury Battery Company, Waterbury, Conn.—Primary batteries. Represented by E. E. Hudson, G. A. Nelson, S. J. Hough and G. S. Gannt. Space 38.

Wayne Oil Tank & Pump Company, Fort Wayne, Ind.—Oil storage systems; oil burning systems; oil filtration systems; metal forging; metal melting and metal heat treating systems. Represented by S. D. Rickard, Carver Wood, R. E. Langston, F. J. Panot, Stephen Malatesta and Edwin Arnold. Space 15.

Western Electric Company, Inc., New York City.—Telephone train dispatching equipment; floodlights; train lighting lamps; heavy duty plugs and receptacles; miscellaneous supplies. Represented by George Hull Porter, E. V. Adams, O. C. Danielson, E. B. Elliott, T. J. Rider, Bob Evans, W. O. Turtle, Walter S. Shawvan, Oscar Lepper, R. D. Eves, A. L. Frankenberger, J. P. Casey, Wm. Lancaster, E. Kearns, H. C. Olmstead, R. M. Campbell and A. L. Crater. Spaces 58 and 59.

Wm. Wharton, Jr., & Company, Inc., Easton, Pa.—A.R.E.A. stiff frog; solid manganese steel frogs; manganese track society standard railbound manganese frog; manganese tipped switch points; insulated and adjustable switch rods; guard rail clamps; miscellaneous switch fittings. Represented by Victor Angerer, Charles M. Griffith, H. F. McDermott, S. G. Llewellyn and J. H. Hock. Spaces 200 and 215.

Wheaton & Probasco, Ionia, Mich.—Metal railroad tie. Represented by V. B. Wheaton and C. R. Probasco. Space 207.

Woolery Machine Company, Minneapolis, Minn.—Light-weight engines and railway motor cars. Represented by H. E. Woolery. Space 210.

The Wyoming Shovel Works, Wyoming, Pa.—Track shovels. Represented by H. T. Potter, G. E. Geer, H. C. Emery, C. H. Broward, Wm. H. Ziegler and J. W. Foyle. Space 103.

Coliseum Open This Evening

The Coliseum will be open until 11 o'clock this evening, this being the only evening during the exhibit of the National Railway Appliances Association that it will not close at 6:30. No program is scheduled at the Congress by either the American Railway Engineering Association or the Signal division of the American Railroad Association, so that many railway men will make it a point to make a thorough study of the exhibit without neglecting the sessions of the conventions.

Large Bridge Contract

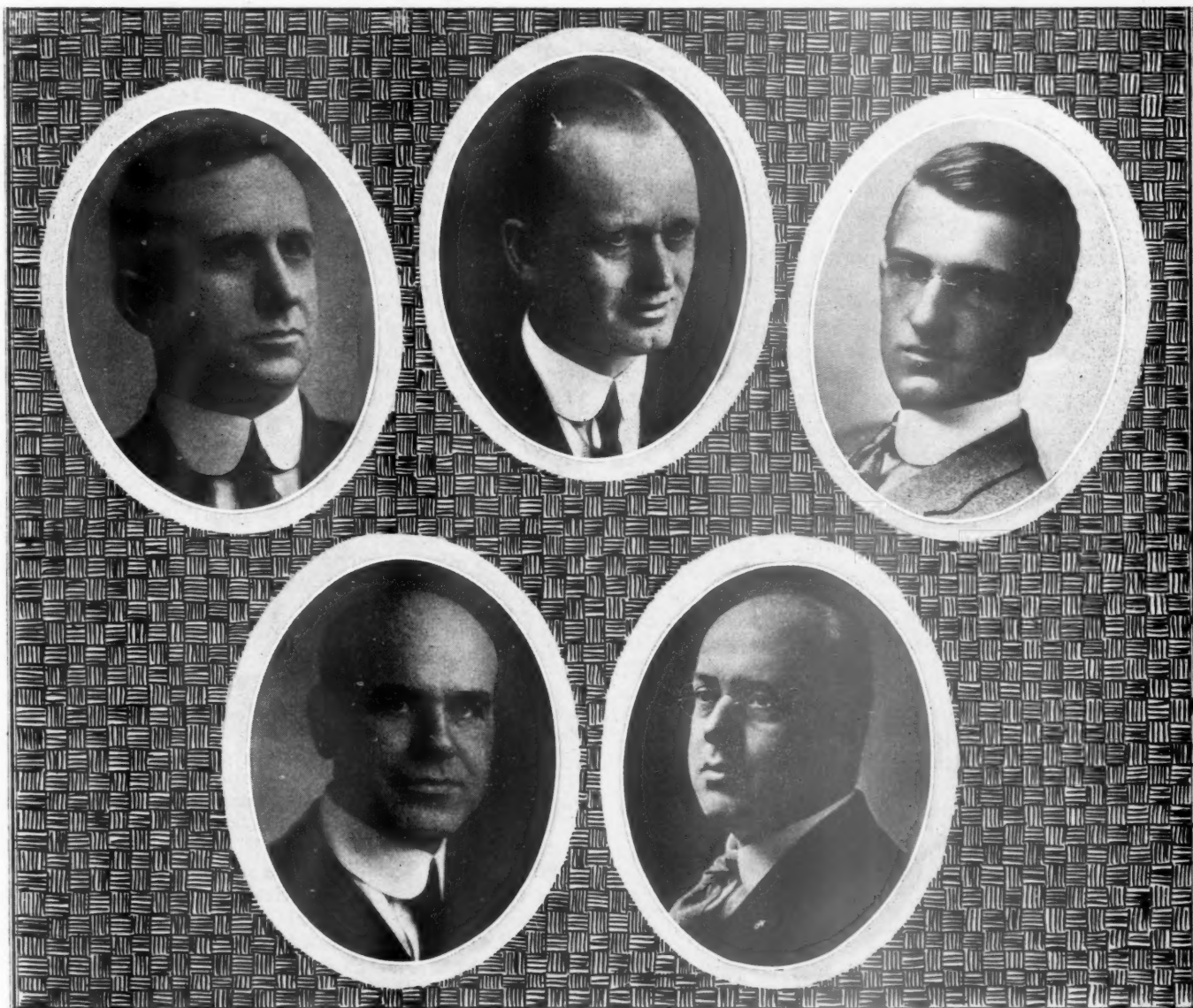
The Philadelphia & Reading has awarded a contract to the Smith McCormick Company, Easton, Pa., for the construction of a double track concrete arch bridge across the Susquehanna river at Harrisburg. This bridge will be 3,500 ft. long and will consist of 46 arches. It will replace an existing single track bridge.

New Signal Division Committee Chairmen

The Assignment of New Work and Changes in Personnel
Result in Appointment of Five New Men

FIVE MEMBERS appear as new chairmen of committees in the 1920 Signal division committee assignments. Samuel Miskelly, signal construction engineer, Chicago, Rock Island & Pacific, was appointed chairman of Committee No. 2—Mechanical Interlocking; J. C. Mill, signal engineer, Chicago, Milwaukee & St. Paul, was appointed chairman of Committee No. 14—Lightning Protection; J. M. Carley, signal estimator, valuation department, Boston & Albany, was appointed chairman of Com-

mittees for Electric Railways, was dropped and this number was assigned to the new Valuation Committee which was appointed subsequent to the amalgamation of the Railway Signal Association with the American Railroad Association. Committee No. 16—Harmonizing, was consolidated in 1919 with Committee No. 1—Editing, and No. 16 was assigned to the Committee on Oils. Committee No. 17—Nominations, was dropped in 1919, and this number was assigned to the new committee on



I. S. Raymer

J. C. Mill

Samuel Miskelly

J. M. Carley

J. Leisenring

New Signal Division Committee Chairmen

mittee No. 15—Valuation; I. S. Raymer, assistant signal engineer, Pittsburgh & Lake Erie, was appointed chairman of Committee No. 16—Oils; and John Leisenring, signal engineer, Illinois Traction System, was appointed chairman of Committee No. 17—Pole Lines.

Some changes were made in committee numbering in 1920. In 1919, Committee No. 15—Signaling Require-

Pole Lines. With the above exceptions the committee numbering remains the same as during 1919.

Samuel Miskelly

Samuel Miskelly, the new chairman of Committee No. 2—Interlocking, has been an active member of the Railway Signal Association and the Signal division of

the American Railroad Association for a number of years. He succeeded C. J. Kelloway, superintendent of signals, Atlantic Coast Line, who was elected chairman of the Signal division for this year. Mr. Miskelly is well qualified to head Committee No. 2, since he has served continuously on this committee for the past nine years, and since 1916 as vice-chairman. Besides his work on this committee he also served as a member of the special committee on Storage Batteries in 1910. Mr. Miskelly brings with him as chairman of Committee No. 2 an extensive experience in signal work. He began his career in November, 1899, with the Union Switch & Signal Company. About two years later he resigned to enter the service of the Chicago & Western Indiana, but only remained with that company until November of the following year, when he was appointed signal foreman on the Chicago, Rock Island & Pacific. Since that time he has worked up through the various positions in the signal department to that of signal construction engineer for the system, which is the position he now holds.

As chairman of Committee No. 2, it will be the duty of Mr. Miskelly to direct the preparation of important specifications for adoption by the Signal division, among which are the specifications for mechanical interlocking machines of the improved Saxby & Farmer and the Stevens type, also specifications for electro-mechanical interlocking machines having improved Saxby & Farmer and Stevens locking. It is also the duty of the committee to prepare specifications covering different classes of work which would ordinarily be assigned to such a committee, such as those for mechanical connections and for various classes of concrete work as concrete foundations; concrete trunking; concrete bell posts and concrete relay posts.

J. C. Mill

J. C. Mill, as chairman of Committee No. 14—Lightning Protection, brings to the committee an extensive knowledge extending over a number of years covering investigations of this character. He has served continuously as vice-chairman on this committee since 1914, when it was appointed as a special committee to investigate lightning protection. In 1918 this special committee was assigned the number by which it is now identified. In addition to his work on this committee, Mr. Mill was a member of Committee No. 4—Automatic Block Signaling, in 1913, and in 1916 and 1917 he served as a member on the Board of Direction of the Railway Signal Association. Besides being made chairman of Committee No. 14, he was also appointed a member of Committee No. 8—Alternating Current Automatic Block Signaling.

It is the duty of this committee to prepare a report on methods of protecting signal apparatus against lightning and to also draw up specifications for lightning arrester grounds, considered an important part in any scheme of lightning protection adopted for signals. Mr. Mill's qualifications to handle such work is based on his experience in signal engineering. He was chief draftsman in the signal department of the Chicago, Milwaukee & St. Paul from 1901 to 1909, when he was appointed signal inspector; in 1912 he was promoted to assistant signal engineer, from which position he advanced to that of signal engineer of the system, on August 1, 1913.

J. M. Carley

Committee No. 15—Valuation is headed by J. M. Carley, who has had extensive experience in valuation work, dating from 1910. That the Valuation Committee is destined to be one of the most important committees of the Signal division is evident from the important

bearing placed upon valuation in the transportation act approved February 28, returning the railroads to their owners. Mr. Carley's experience in various branches of railroad work since 1892 fit him for directing the work of this committee, of which he was appointed chairman in December, 1918. Mr. Carley entered railway service on the Lehigh Valley 28 years ago, as a helper and telegraph operator, resigning on November 1, 1899, to enter the service of the Buffalo, Rochester & Pittsburgh as relief agent and station agent. About two years later he went with the New York Central & Hudson River at Buffalo, N. Y., as relief signalman. Subsequently he served as draftsman and signal maintainer, and in 1911 he was transferred to the signal engineer's office at Albany, N. Y. During the previous year, however, he served as one of the seven inspectors who assisted in making a tentative physical valuation on the New York Central taken that year. Later Mr. Carley was employed successively as draftsman, circuit draftsman, office inspector and field inspector in connection with signal improvements on the New York Central from 1913 to 1917. In May of the latter year he was transferred to his present position as signal estimator on the Boston & Albany, with headquarters at Boston.

As chairman of the Valuation Committee it will be the duty of Mr. Carley to direct the preparation of a report on the federal Bureau of Valuation's method of applying depreciation and report on the average service life in years of the important units of the different types of signal installations. In addition to this work the committee is instructed to prepare a table for the different types of signal installations which will show the percentage of materials to be added to cover miscellaneous materials not inventoried and loss and waste in construction. Another duty of this committee is to prepare a typical construction program which will include the various types of interlocking and automatic signals and other signal apparatus for single track, double track, three track, and four track railroads; and also continue the study of the work of the Joint Signal Committee of the President's Conference Committee and the Bureau of Valuation of the Interstate Commerce Commission regarding labor costs to establish a percentage to be added to materials in order to arrive at the total cost of an installation.

I. S. Raymer

In the past, too little attention has been paid to the importance of oils in signal department work, and I. S. Raymer as the new chairman of Committee No. 16—Oils, is charged with the preparation of methods for testing oils and the review of specifications for illuminating oils with a view to raising the standard requirements. In addition to this work Mr. Raymer, as head of the committee, will also direct the preparation of specifications for motor gasoline, lubricating oil and transformer oil.

Mr. Raymer began work with the Union Switch and Signal Company in 1898. The following year he resigned to enter the service of the Pittsburgh & Lake Erie, with which road he has since been continuously employed, and is now assistant signal engineer. In 1900, he became a member of the Railway Signaling Club, later the Railway Signal Association and now the Signal division of the American Railroad Association. Mr. Raymer has been actively connected with committee work in the Railway Signal Association and Signal division, having been identified with committee activities since 1907, when he was appointed a member of Committee No. 4—Storage Batteries. The following year he was transferred to Committee No. 3—Power Interlocking, on which he has since served continuously.

Four years ago he was appointed vice-chairman of Committee No. 3, serving in that capacity until he withdrew to become chairman of Committee No. 16—Oils. In 1917 and 1918 he served as a member of the Board of Direction of the Railway Signal Association, and since 1915 he has been chairman of the Pittsburgh Sectional Committee.

John Leisenring

As chairman of the new Committee No. 17—Pole Lines, Mr. Leisenring is well fitted to handle its work, because of his experience on other important committees of the Railway Signal Association and the Signal division which required an understanding of pole line requirements under conditions that would provide adequate service for the efficient operation of apparatus used in signaling. Mr. Leisenring first became active in signal association matters in 1910, when he served as a member on a committee whose work involved the study of signaling for electric railroads. Two years later he became identified with a similar committee whose work involved electric railway and alternating current signaling, and from 1913, to and including 1919, he served on the special committee on signaling requirements for electric railways. In 1918 this special committee was designated as Committee No. 15, then in 1919 its work was discontinued. In 1917 he also became a member of Committee No. 1 (now Committee No. 10)—Signaling Practice, of which committee he is still a member. Last year he was also appointed on Committee No. 12—Contracts.

Mr. Leisenring's experience in the field of railway signaling began on January 1, 1903, when he entered the service of the Baltimore & Ohio. Shortly after, however, he severed his connection with railway work for a period of two years, during which time he was employed in the designing department of a manufacturing concern. He then returned to railway service in the engineering department of the Lehigh Valley, where he remained for about two years, following which he became assistant engineer of tracks and signals in connection with the construction of the Hudson River tunnels. Later he was promoted to signal engineer in charge of the design and installation of all signal work within the tunnel zone, which position he held until December, 1910, when he became signal engineer of the Illinois Traction system.

As chairman of the new committee 17—Pole Lines, it will be Mr. Leisenring's duty to supervise the preparation of specifications, in co-operation with the Telegraph and Telephone division of the A. R. A., and in conference with the committee of the A. E. R. A. on standard threads for pins and insulators.

Change in Office Location

The pre-emption of the rooms along the north side of the second floor of the hotel by the Wood campaign headquarters made necessary the removal of the offices of the secretary of the American Railway Engineering Association and the *Daily Railway Age* to the south or rear of the Florentine Room. The secretary's office is located in room 1120, while the *Daily Railway Age* has 1124 and 1128.

Track Committee Meets

The Track Committee of the American Railway Engineering Association met at the office of the secretary, 431 South Dearborn street, at 10 o'clock yesterday morning to consider unfinished work of the committee.

Mr. Hooley on the Railroads' Return

"**A**NYTHING NEW?" inquired Mr. Dennissey, as he strolled into Mr. Hooley's place, more from the force of habit than in the expectation of any physical comfort the visit might afford.

"It's arl new, 'nd I can't git anny av it at that," replied Mr. Hooley, dryly. "If ye won't dhrink me long-distance from beer 'nd ye can't get annything else, what is it ye have on ye'er mind?"

"I was comin' along the sthreet," replied Mr. Dennissey, "whin I heard some min talkin' about the conviction av th' injineers ye towld me about last year, 'nd how that they'd be betwixt th' divil 'nd th' deep blue say, what wit' th' gov'mint toornin' th' roads back to thim 'nd wit' th' Amerycan Relrod Association thryin' t' adopt thim, 'nd all that. What d'ye think about it?"

"I think so," replied Mr. Hooley.

"Think what?" inquired Mr. Dennissey, thirsty as ever for information, among other things.

"How kin I till?" rejoined Mr. Hooley. "How do I know what I think? Here's th' Association av Relrod Injineers, 'tis now twenty-wan years old, I mind, 'nd it has gone along f'r thim twinty-wan years wit'out anny hilp fr'm th' gov'mint in th' way av littin' thim have spindin' money f'r th' wor-rk they had to do to kape th' relrods in wor-rkin' condition. Ye see, 'tis this way, Dennissey," continued Mr. Hooley, warming up to his subject, but without his former artificial stimulant to lubricate the gearing of inspiration. "'Tis this way. Th' Intershtate Commerce Commission has control over th' rates th' relrods 's allowed to charge f'r haulin' freight 'nd passengers, 'nd wudn't lit thim raise their rates whin 'nd before th' Bawlshivviki in Yurruup 'nd this gellorious country shtarted up th' ruckus that brought owld H. C. L. among us as a perminint resident. T' make a long shtory short," continued Mr. Dooley, after a pause long enough to get his pipe drawing sonorously, "th' relrods was in a way like me father was 'n th' owld days, whin he was huntin' a big gray wolf, 'nd found th' wolf had choosed the same day f'r huntin' him. Th' wolf looked hungrier 'n me father thought he was at just that time, 'nd cud run faster.

"Will, all there was to it f'r me father was t' t'row away his gun, 'nd thin his Bennycoat, 'nd iverythin' he cud cut loose fr'm, 'nd run like th' divil was afther him, 'nd indade, he was."

"'Tis a good shtory," interrupted Mr. Dennissey, "but whativer's th' wolf shtory got to do wit' th' relrods 'nd th' gov'mint?"

"Ye're mind's wor-rkin' on its usual high gear," replied Mr. Hooley, with a touch of sarcasm. "Th' relrods has bin runnin' t' kape away fr'm th' high cost av runnin' thrains, 'nd has thrown away ivery chance t' spind a cint on kapin' th' thracks 'nd things in good condition, 'nd now th' gov'mint has turned th' rodes back t' their lawful owners, jist as th' wolf turned back fr'm chasin' me father whin he was shtripped fr'm ivery thing loose that was on him, 'nd then lift him where he was."

"Where was ye'er father," inquired Mr. Dennissey, with a revival of interest, "'nd where'd the injineers come in?"

"He was up a three, 'nd the injineers, shpeakin' paregorically, is in much th' same condition as to gittin' money to spind, or, 's ye'll be whin ye ask me f'r a dhrink."

"What'll I get?" inquired Dennissey, eagerly.

"Grape juice," replied Mr. Hooley, briefly, as he prepared to close the place. "I may have somethin' on me hip tomorrow."

Meeting of the American Association of Engineers

Second Railroad Conference Held Yesterday in the
Florentine Room at the Congress Hotel

THE SECOND ANNUAL RAILROAD CONFERENCE under the auspices of the American Association of Engineers was held yesterday in the Congress Hotel, Chicago. The program for the day provided for morning, afternoon and evening sessions, with the morning devoted chiefly to the presentation and discussion of the reports of the various railroad sections and a review of association activities in the railroad field during 1919. The afternoon session provided the opportunity for the presentation and discussion of papers and reports relating to the future railroad work of the association, and the evening session for the presentation of several papers of timely interest.

G. W. Hand, assistant to the president, Chicago & North Western, and chairman of the Railroad committee of the Association, opened the afternoon session by outlining plans for future activities of the association in the railroad field. Mr. Hand drew attention to the opportunities presented in the present situation of the railroads for engineers to extend the scope of their activities. He mentioned particularly the problems which will arise by reason of the legislation under which the railroads were returned to private control on March 1, and the engineer's responsibility in their solution.

In the discussion which followed Mr. Hand's remarks, the vital importance of loyalty on the part of engineers to employers was stressed and it was suggested that disloyalty proven should bar individuals from membership in the association. J. R. Leighty, of the Missouri Pacific, summed up the discussion of this topic substantially as follows: That it seemed to be the sense of the meeting that plans for future activities of the association in the railroad field must contemplate ways to make the services of engineers more comprehensive and valuable, to sell this more valuable service at a price fair to both the engineer and the employer and to accompany the sale of this service with a guarantee to employers that value would be received for the increased compensation granted.

Railroad sections of the association and their relation to the railroad management and to the chapters of the association were also outlined and discussed in the afternoon session. Their function was outlined to be to promote good feeling between the management and the engineers; to encourage the interchange of ideas and to promote the economic welfare of engineers.

This session was brought to a close by the presentation and discussion of proposed amendments to the schedule of salaries for railroad professional engineers which was adopted at the first conference held last March in Chicago and published in the *Daily Railway Age* of March 18, 1919. These amendments were presented in an endeavor to more clearly define the duties and scope intended to be included under particular titles.

EVENING SESSION

The evening session was devoted to papers read by Arthur S. Tuttle, chief engineer, Board of Estimate and Apportionment, New York; Oscar C. Merrill, chief engineer, U. S. Forest Service, Washington, D. C., and Col. Bion J. Arnold, consulting engineer, Chicago, on the classification and compensation of engineers. These papers were based on data collected by the committee representing Engineering Council, whose report on the

salaries of technical men was published in part in the *Railway Age* for February 6, page 440.

Mr. Tuthill outlined and explained in detail the principles underlying the work of the committee in so far as the matter of classification is concerned and called attention to some of the advantages which must accrue from such a classification. In carrying out this work the responsible heads of 191 services, federal, state and municipal, were approached by the committee for information, 101 of whom replied in full and in ample time to be considered in the deliberations.

Mr. Merrill devoted his remarks to the compensation activities of the committee and outlined the general principles which underlie this portion of the committee work. He drew particular attention to the fact that investigation had disclosed the fact that salaries in the classified Federal, State and Municipal services were in many cases below the minimum of \$2,200 per annum, which is generally accepted as the least amount on which a family can be maintained in comfort and decency. This fact was emphasized to draw attention to the importance of the compensation angle of the committee's work.

Col. Arnold briefly summarized both phases of the question and pointed out the advantages which would accrue from co-operation between the committees of the Association and Engineering Council which are concerned with these matters.

Problems confronting the railroads on their return to private control was the topic discussed by S. M. Felton, president of the Chicago Great Western. Mr. Felton outlined briefly the conditions of the roads when returned to their owners on March 1, drawing particular attention to their inadequacy to care for the traffic offered, due to the fact that during the war period expansion of facilities ceased almost entirely. He pointed out also the deficiencies which exist in equipment, basing his conclusions on statistics covering a period of 15 years.

He also drew attention to policies adopted or perfected during the period of federal control which have resulted in increased efficiency in operation. Prominent among these were joint operation of terminals and activities to promote limit loading of cars. The advantages of retaining these and other similar measures under private control were urged.

Mr. Felton also discussed the labor problem confronting the roads and gave a brief review of the legislation designed to meet this situation.

D. A. Tomlinson (Portland Cement Association) talked on the work done by A. A. E. to bring about adjustments of engineers' salaries during the period of government control of the railways. The policy pursued in conducting this campaign was one of education—to point out the value of engineering services and direct attention to inequalities in compensation. It was Mr. Tomlinson's idea that the same general principle properly applied to all activities of the association in this direction. Whereas in the case he referred to the educational work was directed at the engineering and executive offices of the railroads and the Railroad Administration, it could be applied in general to the public as a whole.

F. H. Newell, professor of civil engineering, University of Illinois, and president of the Association, concluded the program with an address treating of the aims and ideals of the Association.

W. W. Salmon Sees

Improved Business Outlook

"IN CONSEQUENCE OF THE adoption of the new policy towards the railways, it seems to be quite certain that credit will greatly improve; that needed capital will hereafter be obtainable by railways on reasonable terms; that the most progressive and aggressive railway managements, in their natural desire to obtain for themselves the largest possible share of the aggregate net operating income of the rate-making group to which they belong, will procure additional and improved devices designed to reduce operating expenses; and that manufacturers of railway equipment, devices and material will in the not distant future find their facilities taxed to the utmost." This was the optimistic statement of W. W. Salmon, President, General Railway Signal Company, to a representative of the *Daily Railway Age*.

Mr. Salmon, as a member of the National Transportation Conference Committee of the United States Chamber of Commerce, has been closely in touch with the railway program developed by the United States Chamber of Commerce, and with the framing of the legislation in Congress. Mr. Salmon said, further, that "it was the opinion of the National Transportation Conference, composed of representatives of commercial, industrial, agricultural, financial, labor, governmental, transportation, economic, civic and social interests, that railway credit would be greatly strengthened if Congress would enact a law 'requiring that railway rates and fares, to be established by public authorities, shall be designed to yield the railway companies in each traffic section of the United States, aggregate revenue sufficient to produce, after proper provision has been made for renewals and depreciation, a net return (which shall be available for interest and dividends) of not less than 6 per cent per annum upon the aggregate fair value of the property of the railroads devoted to the public service in each of the several sections, the items of renewal and depreciation to include unproductive improvements not properly chargeable to investment account and against which no capital or capital obligations shall be issued.'"

In comparing the rate provisions of the Transportation Act as passed with the recommendations made by the National Transportation Conference, Mr. Salmon said that, "while the rate provisions of the Transportation Act do not conform in every detail with the recommendations of the National Transportation Conference, they appear to me to accord with them as closely as could have been reasonably expected, and it is my belief that in view of the more enlightened and liberal policy of the government and the people toward railway rates, so strongly indicated by the passage of the Transportation Act and its approval by the President, the Interstate Commerce Commission will honestly and earnestly seek to give full effect to the law which provides that 'it shall give due consideration to the transportation needs of the country and the necessity (under honest, efficient and economical management of existing transportation facilities) of enlarging such facilities in order to provide the people of the United States with adequate transportation.'"

Presidential Aspirations

With "Lowden for President" and "Wood for President," signs on all sides of the Florentine Room at the Congress Hotel are taking on much the appearance of a presidential campaign headquarters. Not the least significant development along political lines is the prominence of women's organizations in anticipation of the adoption of the 19th amendment.

Oh! Gosh Darn It All

"HEY! YOU FELLERS, COM'ON over here, 'n get Tom, 'n Dick, 'n Harry, 'n all the rest of the bunch, too." It was Jimmie talking, a regular feller, and pretty wise, too. "Say, let's get together and have a sure-enuff talk. I've got sumthin' you'll be wantin' to hear. Lissen! Now ain't we done pretty good work for—for—oh! a long time, an' ain't we old enuff to wear long pants and know what's right and what's wrong? You betcha we are. Now, I ain't kickin' on workin' like the deuce during the big scrap and lettin' Ma boss the whole works, but gee! that's all over now and I wanta be my own boss. Whatcha say, Dick?"

"Gosh, Jimmie! Ain't you 'fraid that Ma'll raise the dickens?"

"Naw! We can say how we're goin' to tell her everything we do."

"All we do?"

"Well-ll, nearly all—mebbe."

"But she ain't said we could git away on our own hook."

"Yeah! I know all that, but we c'n slip away and she won't know a thing until we're gone. Whacha think, fellers?"

"Sure!"

"I'm on!"

"Let's go!"

"Some kid!"

"That's the stuff!"

A whole chorus greeted him. There were a couple that didn't enthuse much, but nobody seemed to care about them. And so they made their plans, called it a day and started out to do something else. But! But!

"Oh, Jimmie!" It was Jimmie's little sister who came running up, her cheeks a "Rudd-y" glow. "Just you wait a minute—think you're smart—dontcha. Tee hee! Ma knew all the time what you boys were a-doing. And you'd better come on home, and you too, Dick and Tom, and—and all the rest of you fellers."

"Naw! We won't, either!" said Jimmie, getting red. "We know what we're doin'."

"Oh, you do, do you," screamed the little sister. "Oh, you do! Well you'd better come on like I'm tellin' you, cause if you don't Ma'll sure fix you."

"Yeah, run along Jimmie," said one of the rest, "and grab onto yer Ma's apron strings."

"Aw, believe me, if I gotta grab any apron strings," said Jimmie, "I ain't goin' to be alone, cause I know my Ma, and I'll bet she's told your Ma and all the rest of your Ma's. Yeah, and I'll bet their all a-waitin' for us now."

"Gee! Fellers, ain't it hell, and it was regular sure-enuff plans, too. Oh! Oh! Oh! Gosh darn it all!"

Mr. Jacobs Did Not Know It, But—

THE "ORDERED CALM" OF THE editorial rooms of the Chicago office of the *Railway Age* was broken.

The March Dailies were only three days away and the annual concentration was at its height. Copy must be prepared in abundance and the smallest detail must be attended to that the task of issuing four magazines in as many days might be accomplished without a hitch—and incident thereto was the securing of a photograph and sketch of P. C. Jacobs, president of the National Railway Appliances Association.

A telephone call to the offices of the concern boasting Mr. Jacobs' name on its list of officers elicited the information that "Mr. Jacobs is out of town." A telegram to the absentee brought the reply, "Take the keys to my

house from ———, get the photo from the house and let them use it."

Now enters the hero. Mr. ———, of the aforementioned concern, obligingly sacrificed the noon hour to follow the behest contained in Mr. Jacobs' telegram.

With considerable aplomb, not to mention fearlessness, Mr. ——— arrived at the Jacobs' mansion, mounted the steps, inserted the key—and the house engulfed him.

Some time later Mr. ——— might have been seen to emerge from the home with a package under his arm. In fact, several persons did see him. Two burly gentlemen with suspiciously large and heavily shod feet approached cautiously. One tapped Mr. ——— on the shoulder.

"You're pinched, me fine burglar," the burly, flat-footed one declared.

"But ———," stammered the bewildered Mr. ———.

"Never mind. Tell it t' the judge," was the reply, as Mr. ——— was gently yet forcibly propelled toward the police station.

But, why go on?

A neighbor, knowing the Jacobs were away, noted the entrance of Mr. ———, and became suspicious; telephoned the "Bulls"—you've read the rest.

Oh, yes. Some hours later an irate gentleman might have been seen to emerge again, this time from a police station. He still wildly clutched a package.

But you would never have guessed it when the meek and lowly office boy appeared in the aforementioned editorial rooms of the Chicago office of the *Railway Age*, whose "ordered calm" was broken, and said:

"Here's a fuddygruft of Mister Jacobs."

Mr. Jacobs doesn't look as if he knew this story as he gazes at you from page 827.

The Manufacturers Are Ready

That the supply manufacturers are prepared to handle a large business in 1920, is the opinion of A. A. Taylor, manager of the railroad department of Fairbanks, Morse & Co., Chicago. "I am an optimist," said Mr. Taylor. "In fact, all salesmen are optimists; they are born that way and I believe that most manufacturers of railway equipment and supplies are inclined to feel the same as I do. Based on this conclusion, our own company has arranged for large stocks in anticipation of demands from the railroads and I know that other concerns have done the same."

In voicing this opinion, Mr. Taylor made no claim of an ability to forecast. He said no one can say just what will happen to the railroads, but from all indications he can see but one thing—that the railroads must go ahead. The country at large is in a prosperous condition. America has lots of money, in fact, everything that is necessary for achievement and the railroads are absolutely essential to this. An industrial concern like Fairbanks, Morse & Co. serves a large number of people and it would be a serious matter if this company should cease to function. However, this would be a minor matter as compared with the inability of the railroads to serve the shippers properly.

"If the present high labor costs are to continue," said Mr. Taylor, "it is a 'ground-hog' case that the railroads must have greater compensation for work performed. My understanding is that the railroads are to be allowed to combine properties, subject to the approval of the Interstate Commerce Commission, and this being the case, such combinations are very likely to take place to a considerable extent to the end of reducing expense of operation.

"Furthermore, if the railroads are allowed to function according to most efficient practices, without continual interference by unjust and uncalled-for legislation, it will be a wonderful incentive to railway officers in their work of bringing the various properties back to a good financial and physical basis.

"The railway supply industries as a whole are in position to take care of a large amount of business from the railroads, particularly those having the foresight to start stock accumulations considerably before the time the roads were turned back by the government."

With regard to the business immediately in sight, Mr. Taylor said that orders now in hand prove that 1920 will be a better year than 1919. As well known, the United States Railroad Administration made only such purchases as were absolutely necessary last year, but in spite of this, 1919 was a bigger year than 1918, which in itself was considered a year of excellent business. "Taking all things into consideration," said Mr. Taylor, "including such information as we learn regarding the budgets that have been prepared, 1920 will be a good year."

Dedicated to the N. R. A. A.

If you can show your goods when all your rivals
Are showing theirs, and keep your head raised high
When you see your choice designs belittled,
And not yourself your rival's goods belie.
If you can treat the fickle god of fortune
The same how'er the tide of luck may go,
The chances are you'll more than come out even,
And, what is more, add morale to the Show.

If you can meet with old-time friends and workers,
Competitors, and p'raps old friends no more,
And give to all a courteous explanation
Of what your goods are like and what they're for;
If you can give to all a hearty welcome
Regardless of their power or lack of pelf,
That stray into your booth for information,
You're an asset to the Show and to yourself.
With apologies to R. K.—Charles MacGregor.

Inland Waterways

The Railway Engineering section of the Western Society of Engineers will hold a meeting at the rooms of the society in the Monadnock block at 7 o'clock, Tuesday evening, March 16, at which Theodore Brent, assistant chief of the Division of Inland Waterways of the United States Railroad Administration, will present a general discussion of The Present Status of Inland Waterways in the United States. The members of the American Railway Engineering Association and the Railway Signal Association and other engineers visiting the city are especially invited to attend this meeting and to participate in the discussion of this live subject.

New York Central Contracts for Large Building

The New York Central has awarded a contract for the building of 13 additional stories on its mail and express building on Lexington avenue between Forty-fifth and Forty-sixth streets, New York City. Contracts for the fabrication of the steel have been granted to the Phoenix Bridge Company and for its erection to Terry & Tench Company, Inc., New York City. The contract for the general construction of the building, exclusive of steel, has been awarded to James Stewart & Company, New York City. It is planned to start construction in June of this year and complete it early in 1921.

Reunion of Santa Fe Signal

Supervisors' Committee

A reunion unpretentious but no less interesting to those in attendance was held for the sixth time in the English Room of the Congress Hotel at luncheon yesterday noon, by the past and present members of the Santa Fe Signal Supervisors' Committee. This affair has come to be as regular as the March meeting of the Signal Division A. R. A. Those present were T. S. Stevens, signal engineer; L. Brown and G. K. Thomas, assistant signal engineers; H. Hobson, signal supervisor of the Santa Fe; E. Hanson, signal engineer, G. C. & S. F.; G. R. Cowherd, signal engineer, E. P. & S. W.; B. T. Anderson, assistant signal engineer, D. L. & W.; P. B. Hyde of the Hyde Battery Company; and J. S. Hobson and J. E. Saunders of the Union Switch & Signal Company.

Committee on Batteries Meets

Committee XI, Batteries, will hold a meeting in the Congress Hotel at 9:30 o'clock Wednesday morning and Thursday morning, March 17 and 18. The representatives of the primary battery manufacturers will be asked to take part in the meeting during the Thursday morning session.

Committee of Direction Signal Division Meeting

An all-day session of the Committee of Direction of the Signal Division was held in the English room at the Congress Hotel on Sunday, March 14. At this meeting the question as to whether the Signal division should withdraw from the American Railroad Association and assume its former status as the Railway Signal Association was considered. All members of the Committee of Direction were in attendance at this meeting. The action taken by this committee is covered in the report of the Signal division published elsewhere.

Foreign Representative Visits Exhibit

E. H. Broman, representing railway interests in Scandinavia, was a visitor at the Coliseum yesterday.

Meeting of Mechanical Interlocking Committee

A meeting of Committee II—Mechanical Interlocking was held on Saturday, March 13, to consider suggestions which the committee had received on the specification for style A interlocking machines after this specification had been forwarded for printing in the Journal. In addition to considering these suggestions, the committee discussed the report prepared by a sub-committee on concrete cable and relay posts.

Calculator for Applying Ohm's

Law to Track Relays

The National Carbon Company, Inc., Cleveland, Ohio, is exhibiting a handy calculator for determining the value of various electrical factors involved in track circuits and also for solving problems involving Ohm's law. R. J. Cox, service engineer in the railroad department of the National Carbon Company, invented this calculator, in such a manner that by turning two of the disks, which in such a manner that by turning two of the disks which are smaller than the third, the two known factors may be read direct from the calculator.

Railway Grade Crossing Signal

THE RAILWAY GRADE CROSSING SIGNAL shown in the illustration is manufactured by the A. G. A. Railway Light & Signal Co., Elizabeth, N. J. This signal is conspicuously painted in white and black diagonal stripes to conform with the prevailing standard painting of crossing gates. It consists essentially of a cast iron lamp or signal head 30 in. in diameter, which is mounted on the top of a cast iron compartment for housing the acetylene cylinder, the pressure gage, the pressure regulator and necessary piping. The lamp box contains the electro-gas valve and burner. Around the top and bottom of the circular signal head appear the word and letters "DANGER, R. R." These are open letters backed up with white frosted glass. In the center of the signal head is an 8 3/8-in. red lens with a 30-deg. spread. This lens is mounted in a hinged ring so that it may be used as a door. The arrangement also permits the signal to be made double or single-faced as desired, with the center of the lens about 6 3/4 ft. from the foundation base. It is claimed that the red flashes of this signal can be seen distinctly in broad daylight for a distance of 600 ft. and after dark the light illuminates the lettering on the face of the signal head.



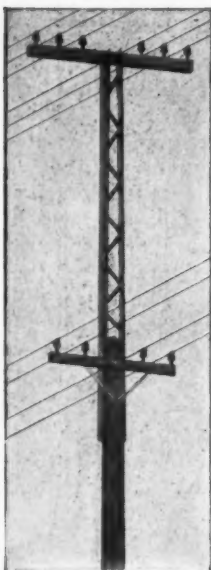
A Light Signal for Crossing Protection

This signal is equipped with a 3/8-ft. burner with the flash set for a 1/4 light period. It is claimed that if it flashes continuously, 2 1/2 cu. ft. of gas would be consumed per 24 hr. and would include 3/10 cu. ft. of gas consumed by the pilot. In service, however, the gas consumption is controlled by the electro-gas valve and the signal operates only during the time the electro-gas valve is released. With track circuit control this release would be during the period a train occupies the track circuits that control the electro-gas valve.

The acetylene gas cylinder is charged under a pressure of 150 lb. per sq. in. at 60 deg. F. The gas passes from the cylinder through the piping of the high-pressure equipment to the regulator, where the pressure is reduced to less than 1 lb. per sq. in. It then passes to the flasher, which proceeds to operate and pump the gas up to the electro-gas valve, where it is checked, until the electro-gas valve is released by external controlling features such as track circuits. The electro-gas valve is wound for 40 ohms and will operate on 2 volts.

An Extension for Wood Poles

A DEVICE THAT HAS BEEN designed for the purpose of increasing the heights of poles in existing pole lines is shown in the illustration. It consists of two main compression members of steel angles, reinforced by steel lace bars. The lower portion of these members open or close to fit the top of any size wood pole, and the method of fastening requires the use of three through-bolts, which are applied in a similar man-



Extension Frame
Applied to Top
of Pole

ner to those employed for holding cross-arms to wood poles, except that the former are inserted through holes in the pole, drilled at right angles to the cross-arm through-bolts.

This steel frame may be used where it is necessary to extend the pole height so as to include additional cross-arms for the purpose of adding a number of new circuits. It may also be used where it becomes necessary to cut off and reset poles because of decayed butts. Still another use may be found, by applying this steel extension frame to the top of poles when it becomes necessary to carry wires over crossings, obstructions, etc. With this device a number of cross-arm heights are possible; that is, a cross-arm can be bolted at the intersection of every lace bar. This steel frame extension is being marketed by S. W. Hull & Co., Cleveland, Ohio.

A New Automatic Highway Crossing Flagman

THE ILLUSTRATION SHOWS a new highway crossing signal of the "wig-wag" type, manufactured by the Thompson Signal Company, Los Angeles, Cal. This automatic flagman consists of a motor-operated aluminum disk 26 in. in diameter, from which a 46-in. aluminum arrow extends in a radial direction. In the center of the arrowhead appears the light for night indication.

This equipment is designed for high or low voltage direct current and may be procured for alternating cur-



Protecting a California Highway Railroad Crossing with an Automatic Flagman

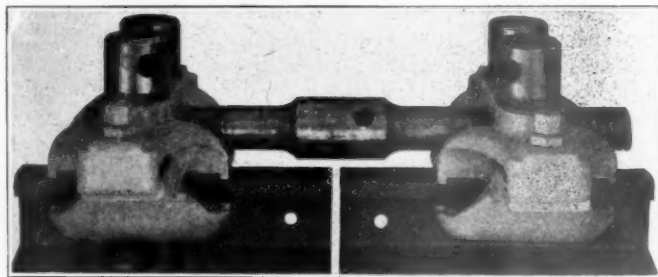
rent if desired. It will operate in either the upper or lower quadrant, and through any arc from 10 deg. to 360 deg., or it may be arranged to rotate continuously in either direction by changing circuit connections.

The motor is contained in an aluminum housing and consists of a four-pole external armature design, which is direct connected to the signal member. Ball bearings are used throughout, and lubrication is necessary at only two points. This equipment is usually wound for 10 volts, and while operating it consumes about 1.8 amperes for a 106-deg. swing. It will start operating from any angle or position at a minimum of 6 volts. Energy is constantly applied during performance and there are no springs or rubber buffers. It has been designed sufficiently out of balance to provide for its return to a fixed place of rest when operation ceases.

This equipment can be provided with or without the compartment of the base of the supporting pole. When it is included, it may be used for housing the operating battery or control relays, thus avoiding the necessity of providing separate equipment for the purpose.

An Improved Rail Joint Expander

THE DEVICE SHOWN IN THE illustration is an improved rail joint expander, manufactured by the Chicago Railway Signal and Supply Company, Chicago. It is used to separate adjacent rails in insulated rail joints for the purpose of inserting fibre end posts and insula-



Chicago Style B Rail Joint Expander

tions and also to bring the rail bolt holes into line with those of the angle bars and switch fittings. This expander is adjustable and will fit any size rail between the limits of 60 and 130 lb. The separating or drawing together of the rail ends is accomplished through a differential expanding screw, which enables one man with a track bar to apply enormous force to the rails. It is claimed the rails are thus pushed apart or pulled together without any injury to the rail ends, such as is the case when using chisels, rams or sledges for the same purpose.

This rail joint expander, known as "Chicago Style B," was developed to overcome some of the weaknesses of the older design of the Chicago rail joint expander. It is claimed the new arrangement gives a greater holding power and by means of the differential screw is enabled to exert an enormous force upon the rails. The device weighs approximately 300 lb. It can be applied by 2 men and operated by one. It is quickly removed from the rail by loosening the four screws at the top, which, when only slightly loosened, permit the dogs to be moved out of the way sufficiently to remove the expander. This device is furnished with screws of various lengths, so that it may be applied over angle bars without removing them. The entire apparatus is made of steel, the jaws of which are provided with tempered steel inserts. These are reversible and replaceable without special tools.